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Fair Treatment of Newsprint Mills Assured

Newsprint Administrator, R. L. Weldon, Issues Statement Allaying Apprehension of Effect On Industry Under Wartime Board—Manpower Shortage In Woods Considered Serious — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 21, 1942—That newsprint operators in Canada need have no apprehension regarding the effects of bringing the industry under the jurisdiction of the Wartime Prices and Trade Board has been made plain by R. L. Weldon, newsprint administration. In a statement on the subject he said that any steps taken to ensure maximum savings in labour and power supplies will be taken with due consideration to the importance of the industry to Canadian economy and will provide, so far as possible, equitable treatment for the different mills.

"What the newsprint administration is keeping in mind," the newsprint administrator says, "is that it must lay its plans with the general overall war effort in mind. Electric power, upon which the manufacture of newsprint makes heavy demands, is increasingly needed for the direct production of munitions of war. So is man-power—for the Navy, Army and Air Force as well as for war industries."

Part time employment in the newsprint industry in accordance with the recent man-power order cannot be permitted, it has been agreed, he continues, nor can electric power be diverted from war industries—hence the tonnage allocation plan which will have as its aim minimum dislocation of labour and maximum use of available power not required for direct war munitions manufacture.

Facts which have to be met by the newsprint administration and the industry are: that a reduction of newsprint production will have to be brought about in those areas where there is now insufficient power available for production of direct war materials; that it may be necessary to reduce the number of machines in operation in mills so that there will be no part time work in view of the demands for manpower existing in direct war industries.

Areas in which the power situation is a deciding factor are; the St. Maurice Valley—districts in Saguenay, Southern Ontario, the which direct war industries are making increasing demands. Allocation of tonnage to meet these needs is now being concentrated upon, Mr. Weldon said, with a view to providing newspaper publishers with their requirements and at the same time causing the absolute minimum of dislocation to the industry and labour.

Government Agency Affords Protection

Protection for the newsprint industry and its customers, the publishers of newspapers in Canada, the United States and abroad, who play an important part in the work of winning the war, is provided by the Wartime Prices and Trade Board order which appointed the administrator charging him to "effect a distribution of the benefits and burdens" among manufacturers in the manner he deems most equitable and "having at all times due regard to the governing factor of the public interest." Provision is also made for the compensation within the newsprint industry of mills whose orders have to be filled by mills located in areas where power is available.

"Canadian newsprint mills," Mr. Weldon points out, "are among the finest, best equipped and most efficient in the world. They are all accustomed to producing high grade newsprint paper for fast running presses which are capable of reproducing good cuts and engravings. This fine quality of work will be maintained no matter what expedients have to be resorted to in order that the industry may make a worthy contribution to the war effort."

Every step of the plans now being prepared by the newsprint administration is taken with reference to the designs of the Department of Munitions and Supply in the matter of power and the Department of Labour with regard to the manpower situation.

Kept equally well in mind is the importance of assuring quantities of newsprint sufficient to meet the current consumption of newspaper publishers who have long relied upon Canadian mills for the paper needed to keep their presses turning.

The Shortage of Woods Operators

So serious is the shortage of manpower for woods operations that the first major effort of the recently formed National Selective Service Board will be to secure men for cutting of pulpwood and timber. The objective is to put 64,500 men into the lumber camps

(Continued on page 16)

Would Equalize Pay of Women in Men's Jobs

Tri-State District Council Decides At Meeting That Women Should Be Paid Same Wage As Men They Replace In Paper Mills — Demand For Wisconsin Casein Declines — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 21, 1942 — Male workers' hourly rates should be paid to women who take over men's jobs in paper mills, according to a stand taken by the Tri-State District Council of pulp, paper mill and converting unions at a meeting at Stevens Point, Wis., Sunday, September 13. Representatives were present from Wisconsin, Minnesota and Upper Michigan.

Raymond A. Richards of Wisconsin Rapids, Wis., sixth vice-president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, submitted the International's stand on the matter. It is, he said, that when women in mills and factories take over men's jobs wholly they should receive the same rate of pay, and where reorganization of work takes place, with part of the work assumed by the men and part by the women, new job classifications should be made and new rates set up by collective bargaining with management.

Other speakers foresaw the loss of jobs by men in the army upon their return if women step into their places at lower rates of pay.

Disapproves Night Work For Women

Employment of women in night work, under the relaxed regulations of the Wisconsin Industrial Commission, was frowned upon by the delegates. Such employment should be permitted, it was said, only in indispensable situations. The council also was reported as not objecting to return from the eight to six-hour day in some instances if pay rates are not reduced. This question arose during a discussion of curtailed operations at some mills as the result of overproduction and effects of the war on the paper making industry.

Miss Valeria Brodzinski of Menasha, Wis., international representative of the pulp and sulphite workers, asked that at least one woman employee sit in at all local union conferences.

The council incorporated in its minutes a resolution adopted by the Wisconsin State Federation of Labor declaring no paper shortage exists, and calling on buyers to ask that their purchases be wrapped.

Group sessions were held in the morning, and one of the reports submitted by the papermakers at the afternoon session included a suggestion that efforts be made to obtain priority classification for the papermaking industry. Alex Schoen of Green Bay, Wis., president of the council, presided. Speakers included Rasmus Anderson of Green Bay, representative of the International Brotherhood of pulp, Sulphite and Papermill Workers, Emil Noren of Rothschild, Wis., representative of the International Brotherhood of Papermakers, and Prof. E. E. Schwartztrauber, director of the school for workers in industry at the University of Wisconsin.

Management Representatives at Meeting

The sessions closed with a banquet attended by approximately 400, with Rasmus Anderson as toastmaster. Management representatives who were introduced or gave talks were: Leo Barrette and James Rush, Consolidated Water Power and Paper Company; A. J. Schierl, Whiting-Plover Paper Company; Albert Zager and Frank Thalke, Wisconsin River Paper and Pulp Company, and E. R. Purdy, Stevens Point Pulp and Paper Company. The payroll allotment plan for purchase of war bonds was explained by C. R. Morse of the Wisconsin River Paper and Pulp Company, chairman for Portage County, who reported that 2,137 employees or 86 per cent participating in 29 local industries had enrolled on a voluntary basis. Mayor Frank G. Lasecke welcomed the visitors. Speakers for labor included Mr. Richards, Mr. Noren and Ed. Gilbertson of Wisconsin Rapids.

Prof. Schwartztrauber gave the principal address in which he told of the progress made by trade unionism. The day of battling with strikers is gradually disappearing, he said, since the working men and their employers now sit down together in conference. The speakers remarked that labor will have a greater share of responsibility in building a greater world after the war. Fairness of the unions and absence of strikes was commented upon by the management speakers.

Entertainment was furnished by the Stevens Point high school band and other musicians and soloists, and a dance followed.

Wisconsin Casein Market Suffers

With the consumption of casein for papermaking down to about 10,000,000 tons for the year 1942, the price of this product in Wisconsin has dropped from 32 cents per pound last fall to 17 cents this year. Wisconsin's vast dairy industry has produced about 12,000,000 pounds annually, and is finding the market rather demoralized. Normally about 40,000,000 pounds of casein goes into coated papers annually. Both the drop in demand, and the increase in milk production from 114,000,000,000 pounds in 1940 to a forecast of 125,000,000,000 pounds nationally for 1942 are factors which have depressed the price. Greater use for plastics and as casein glue for wood products used in place of metal will help somewhat to restore the demand.

Commission Reports on Pulpwood

County maintained forests produced 18,500 cords of pulpwood during the last year, according to a survey made by F. G. Wilson, forestry superintendent of the Wisconsin Conservation Commission. The cutting rate has been maintained at a conservative level in order to teach land owners the value of selective cutting.

A state land economic inventory made recently shows that at the present rate of planting only about one per cent of the area eligible for reforestation is being restored to forest growth each year. More than 4,300,000 acres in Wisconsin should be replanted to

trees, the survey points out, since they are unsuitable for other economic uses.

Pine and spruce plantations will yield over a cord per acre annually as well as maintaining a valuable protective soil cover, the report adds, noting that 4,000,000 acres would produce 4,000,000 cords with a value of at least $8,000,000. Increased employment would result for both loggers and mills. About 47,000 acres were replanted in 1940, and the totals will be less this year and the next due to labor shortages.

Dr. Forman Goes To Paper Institute

Dr. Loren V. Forman, who has been associated since 1940 with the Mead Paper Corporation at its Chillicothe, Ohio, and Kingsport, Tenn. mills, has been appointed a research associate at the Institute of Paper Chemistry, Appleton, Wis., according to announcement of Westbrook Steele, executive director. He will be instructor in pulp and paper chemistry and in charge of pulp and paper testing.

Dr. Forman is a native of Iowa and received his B. S. degree in chemical engineering from Iowa State College in 1934. He began graduate study at the Institute of Paper Chemistry, receiving his M. S. degree in 1936, and his Ph. D. degree in 1940. His master's thesis was on the bonding strength of adhesives, and his doctor's work dealt with the effect of ultra-violet light on lignin. During this period he spent two years with the Munsing Paper Company, Munsing, Mich.

Explains Status of Paper Industry

Persistent reports intimating that a possible 25% horizontal reduction in paper production may be made, has created an erroneous conception of the actual status of the intentions of the management of paper mills, and what the industry has and is still striving to accomplish in its endeavor to cooperate to the fullest possible extent in the war effort.

This was the subject discussed by E. W. Tinker, executive secretary of the American Paper and Pulp Association, at the Monday luncheon meeting of the Salesmen's Association of the Paper Industry, held at the Belmont-Plaza Hotel, New York, on September 21.

In outlining the latest development in the relations of the WPB and OPA government agencies with the industry, Mr. Tinker said that the sentiment and conclusions expressed at a committee meeting of paper mill executives held in New York last week, reflected an entirely different concept from that publicized. The newspaper report, which Mr. Tinker said had been traced to a WPB department in Washington, was of the same general nature as reported in the September 18, 1942 issue of *The New York Times*, in part, as follows: "A horizontal reduction in paper production is currently being considered by War Production Board officials, it was learned here yesterday, but is meeting strenuous opposition from those executives in the industry to whom the plan has been broached. The alternative is some sort of a nucleus plant program in which production would be concentrated in a smaller number of plants."

Mr. Tinker explained that a change of policy apparently has occurred in the government agencies and that this action has been taken at a time when some mills are operating at a relatively low rate. Executives of the industry, he said, recognize the implications and requirements in every program of conservation or concentration. He suggested that the industry should sum up its value to the nation as a major industry; that he hoped a committee to visit Washington would explain the important contribution of the paper industry.

In critical areas, where manpower is an important factor, Mr. Tinker went on to say, the industry should suggest the employment of men over the customary age, and discuss the conservation of critical material wherever possible with the WPB. He said it was the hope of the industry to also adjust cooperation on an eminently satisfactory basis with the Quartermaster Corps to enable the industry to render its full measure of service to the government and to the progress of the war effort.

Conservation, Mr. Tinker affirmed, had several approaches. A horizontal cut would create havoc and bring great hardship on the paper industry. A cut based on base periods might be used with less disastrous effect, but some exceptions would have to be made. A most practical method, he said, would be to control the production of paper through the control of its use of consumption.

In conclusion, Mr. Tinker said that the paper industry has probably the best prospects of any major industry for emerging from the war. The many uses for paper, increase in population and great utility of paper and wood fiber should constitute the strength of the industry and there can be no doubt that the industry will continue to function, even should future business enterprise be controlled through an altered form of democratic government or by a socialistic policy.

Pulpwood Committee is Formed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 23, 1942—The formation of a Pulpwood Industry Advisory Committee has been announced by T. Spencer Shore, Chief of the Division of Industry Advisory Committees.

Committee members are: William T. Brust, Hammermill Paper Company, Erie, Pa.; R. L. Caldwell, Rhinelander Paper Company, Rhinelander, Wis.; William D. Comings, West Virginia Pulp and Paper Company, New York; A. G. Curtiss, Gaylord Container Corporation, Bogalusa, La.; William Hilton, Great Northern Paper Company, Bangor, Me.; Stanton W. Mead, Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis.; James B. Nash, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; K. A. Swenning, Brown Company, Berlin, N. H.

Also committee members are Walter DeLong, Puget Sound Pulp and Timber Company, Bellingham, Wash.; D. S. Denman, Crown Zellerbach Corporation, Seattle, Wash.; Thomas Farwell, Ryegate Paper Company, E. Ryegate, Vt.; C. E. Wilds, The Brown Paper Mill Company, Inc., Monroe, La.; Irving T. Rau, St. Helens Pulp and Paper Company, St. Helens, Ore.; C. E. Smith, The Champion Paper and Fibre Company, Canton, N. C.; and A. H. Stier, Container Corporation of America, Fernandina, Fla.

David Graham, of the Pulp and Paper Branch, is the Government Presiding Officer.

Buying in Chicago Paper Market on Uptrend

Current Demand for Many Lines of Paper, Including Book Grades, Is Viewed As Good Sign for Active Market This Fall — Plight of Box Industry Reported — Salesmen Plan New Luncheon Feature.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 21, 1942—The consensus of opinion in the Chicago paper market is that business is definitely on the upgrade. This improvement began, according to reports, shortly before Labor Day and there is every indication that swing will bring new buyers into the market. All grades of sulphite and book papers were reported to be enjoying an improved demand as buyers seemed to have sensed the fact that now is the time to replenish sadly depleted stocks. Meanwhile, groundwoods and newsprints were also more active as the nation's business swung into a period of unprecedented demand coupled with stock shortages which meant "business". Krafts were stronger, according to local offices, while bonds and ledgers likewise assumed a more active tone. The waste paper market continued more firm with collections improved and the market in more of a "caught up" condition than for some time past.

The plight of the folding box industry this week caught the attention of Herman G. Seely, well known financial writer of the Chicago Daily News. He writes "as a specimens aftermath of a too-enthusiastic economy campaign, consider current conditions in the paper box industry. The drive to economize got under way about a year ago when meetings were held to restyle packaging; paperboard specifications were reduced and special holiday boxes for 1943 fell under the official ban—at least temporarily."

Mr. Seely pointed out that even more effective were hints sent out by OPA to buyers were advice on how to reduce delivery costs was seized upon avidly because it combined lower overhead with patriotism Then the consumer scrap paper collections began and proved successful beyond all forecasts. Fears of shortages vanished before "a glut of materials that paperboard is made of."

Today, the experienced financial writer points out, shortages of bleaching materials have changed the appearances of certain grades of paperboard and one or two varieties are still a bit hard to get. But in place of scarcity in the great bulk of the materials there is a glut—and "what is bothering the box makers is that the decline in demand is continuing."

The job was so well done that economy still is the rule and establishments are now using and reusing cartons for delivery purposes. Orders on a tonnage basis had dropped 50 per cent or more in the period and the bigger the reduction the greater seemed the patriotic job. Today the folding box industry has an excess of factory capacity for civilian business, despite some pick up in orders for cartons, shell containers and food stuffs.

Finally Gets Recognition

And so the paper "shortage" finally gets recognition from a big Chicago newspaper and it may do some good!

Controllers Meet Here Next Week

The immediate and long-term outlook for business and the part industry will play in the fight against inflation will be studied at the eleventh annual meeting of the Controllers Institute of America which opens September 21 at the Palmer House, Chicago. Specific topics to be discussed at the three day meeting which will attract controllers from the paper making and jobbing industry will include renegotiation and adjustment of war contracts, simplification of business reports to government, civilian goods inventory limitation, the 1942 Federal tax bill and postwar controllership problems. All of the September 23 session will be given over to a consideration of the tax bill. Eaton Reed, head of the War Production Board's special committee on inventory control of civilian goods, will be in Chicago on September 22 to participate in a discussion of this subject so important to paper jobbers and retailers. According to A. R. Tucker, managing director of the Institute, advance reservations point to the largest gathering of controllers and executives of business concerns in the history of the Institute.

Paper Containers for Paint Coming

Local information reports that containers for paint, made of paper, with metal ends, have been developed and are coming on the market to help relieve the wartime tin and iron shortage. Also, paper toweling to wipe out over lining and racks after each use—reported as "a help to easier living and an eliminator of the need of too frequent cleanings as well as a means of protecting linings".

Salesmen Plan New Luncheon Feature

The western division of the Salesmen's Association of the Paper Industry will initiate the football season on September 28 when the sales executives

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and guests will again begin to meet at the Wailing Wall, Chicago's edition of Monday quarterbacks. The Wailing Wall luncheons are held at the Hotel Sherman where the salesmen always meet and the interesting events are likewise held on the Monday date the salesmen have always used. Thus it will be a simple matter for the Association to do its business work during the luncheon period and even after the formal Wailing Wall luncheons are over.

At the Monday, September 21 luncheon, members took formal notice of the death of F. A. Borchers of the Oxford Paper Company, long a member of the Salesmen's Association of the Paper Industry, who died suddenly on September 8.

Keys to Victory Drive Starts

At a luncheon of the Paper Club of New York at the Hotel Roosevelt, New York, on September 16, the progress made by the committees in preparation for the Keys to Victory campaign which will be held September 17 to October 1, was discussed. Leading organizations and associations in the paper industry and trade are cooperating in this campaign.

Arthur W. Pohlman, president of the Paper Club of New York, presided. The guest speaker was Prescott S. Bush, national campaign chairman of the USO War Fund. Mr. Bush told the members that USO was enthused over the two-week drive for old used keys. Proceeds of the sale of the urgently needed material from this drive, which aims to collect 12 million pounds of nickel-silver for the Navy, will go to the USO.

"Key collection," Mr. Bush said, "is rendering a two-fold service to the war effort. No matter how great or how small the fund that may accrue to USO from this effort, I can tell you that every penny of it will be needed and every penny will be well spent." Mr. Bush outlined the extensive service which the USO is rendering to all branches of the armed forces. He said that USO camp shows are furnishing entertainment in the camps and even on battleships. He thanked the paper industry for its sponsorship of the Keys to Victory campaign and told of the many ways the United Service Organizations would find use for the contribution from the drive in their progress, which has more than tripled in the last year and a half.

National Key Girl, Sally Leonard, was present at the luncheon meeting, as was Corp. Larry Kirsch, who originally thought of the salvage value of the keys. Corp. Kirsch said: "Several months ago I suggested that keys be salvaged and I am glad to see the job is going to be done. I was in Germany in the last war where many lessons were learned about salvage. We even made clothes out of grass and wheat straw. Now this key drive—I can only tell you that your sons and brothers working with me at camp are proud to know that our folks back home are seeing to it that we get the tools we need through salvage and conservation and buying bonds. When the keys find their way into our hands in the shape of guns, we promise you that the bullets will find their way into our enemies."

Alfred Walden spoke on the work of the coordinating committee and of the distribution of Victory Key cans, posters and supplies for the drive.

The over-all committee of the Keys to Victory campaign consists of the following paper men: chairman, Tracy Beason, president, Paper Association of New York; Arthur Stein, president, Metropolitan Bag and Paper Distributors Association; Sam Fishman, president, Cosmopolitan Paper and Twine Association; Arthur W. Pohlman, president, Paper Club of New York; Norman Bearsley, vice-president, Salesmen's Association of the Paper Industry; and Joe Riemer, president, Paper Trade Association of New Jersey.

The coordinating committee consists of the following: chairman, Alfred Walden, Walden Sons & Mott; Sen K. Doscher, Lily Tulip Cup Corporation; and Stanley O. Styles, Martin Cantine Co.

Hammermill Awarded "E" Pennant

At impressive ceremonies on the plant grounds in Erie, Pa., the Hammermill Paper Company became the first paper mill in America, and the 49th concern in the entire country, to be awarded the coveted Army-Navy "E" for excellence in the production of materials vital to the war.

The official presentation of the "E" pennant on September 15 was witnessed by 1700 Hammermill men and women, Army and Navy officials and invited guests. The presentation of the Award was made by Lieut. Colonel Charles Cavelli, Jr., QMC, officer in charge of the procurement division at the Jersey City, N. J., quartermaster depot. President Norman W. Wilson accepted the award, the "E" flag to fly above the mill, on behalf of Hammermill.

Lowell Thomas, famous radio commentator and author, acted as master of ceremonies during the program.

Donald S. Leslie, Hammermill's first vice-president and assistant general manager, gave a word of welcome to the distinguished guests representing the Army and Navy and to all other invited guests.

"In accepting this never to be forgotten military decoration," Mr. Wilson said, "I pledge to you and to the other officers of our Army and Navy that every woman and every man of Hammermill will indeed strive mightily to be worthy, and that we will go all the way—no matter what you ask of us—in support of our Country, of her allies, of our men already in service, and of our sons, our brothers, and our sweethearts still to go."

Others who spoke at the ceremonies were Congressman Robert L. Rodgers, Twenty-ninth Pennsylvania District, and Erie's acting Mayor, Joseph C. Martin.

Eight veteran Hammermill men and women accepted the "E" pins on behalf of their co-workers. Commander Ralph G. Walling, Officer in Charge of the Erie area for the United States Navy, made the pin presentations.

Packaging Institute to Meet

The Packaging Institute, Inc. will hold its annual convention on November 5 and 6, 1942, at the Hotel New Yorker, New York, according to announcement made by the executive committee of the Institute. Packaging in Wartime will be the subject of the program discussions.

Members of the Executive Committee are: Joel Y. Lund, president of the Institute, who is vice president of Lambert Pharmacal Company, St. Louis; A. Vernon Shannon, sales manager, Westfield River Paper Company, Russell, Mass., and Charles L. Barr, vice president, F. B. Redington Company, Chicago.

Conservation Reduces Fine Paper Demand

Toronto Reports Attribute Current Saving and Concentration On Standard Lines Is Affecting Fine Paper Output—Insulating Board and Box Production Up — Kraft Paper Demand Is Still Good.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 21, 1942—Conservation is credited with the reversal of conditions in the fine papers business from the well-talked-about prospects of the inability of the industry to take care of the increasing demands. At the beginning of this year conditions indicated there would be no let-up in demand for fine papers. There was considerable doubt as to the ability of the industry to meet domestic requirements alone. At that time manufacturers and others were freely predicting a shortage. To the end of February the demand was largely in excess of productive capacity. Since then business has fallen off to such an extent that backlogs are being depleted and normally prompt deliveries seem to be in sight. Conservation campaigns and concentration on standard lines have proven effective.

At the suggestion of the Federal government the industry drew up plans to simplify and expand production so as to conserve chlorine and pulp and spread the available supplies as far as possible. That these plans were well drawn may be seen from the immediate results achieved. The elimination of much direct-mail advertising helped to pull down the demand which has been particularly noticeable during recent months. Other factors in levelling off the demand were the numerous changes made in the regular lines of production and the top ceiling placed on base weights in many grades; the limitation of colors and other "specials"; reduction in the number of base weights, colors and sizes in some lines.

It is not expected that any of the fine paper manufacturers will be affected by the electrical power restrictions as the amount of power consumed by a fine paper mill is not significant, compared with a newsprint mill.

War Boosts Use of Insulating Board

Insulating board has taken on a new importance since the beginning of the war. Regarded only a few years ago as comparatively unimportant in the pulp and paper industry, insulating board has assumed considerable importance owing to the demand for this product in the erection of temporary military camps.

The upswing started before the outbreak of hostilities. Due to improvements in the product, use of board for insulation, interior decoration, accoustical purposes, etc., the demand had reached considerable proportion in peace time and had good prospects for the future. Then came the war and the unprecedented demand for insulating board for temporary buildings for military purposes and to provide shelter for the bombed-out areas in England.

Board mills in Canada last year produced more than 500,000 tons, the highest production figure to date. Most of this was produced by the four leading companies — Donnacona Paper Company, International Fibre Board Company, Masonite Corporation of Canada, and Building Products, Ltd.

Demand continues good for low-cost housing projects, especially in industrial centres where much war work is being done. While construction as a whole, shows a decline, this type of building is still active. While costs are somewhat higher than they were, the supply of raw materials has not as yet been seriously affected either by priorities or shortages due to the war.

Box Output Continue at High Level

Canadian box manufacturers are operating close to capacity and there is no indication of a lessening demand for their products. The present rate of production is expected to continue until the end of the present year at least.

Kraft Paper Continues in Good Demand

Both domestic and export demand for Canadian kraft papers continues strong. The kraft paper section has been operating at a high rate of capacity for many months. Any let-up will be as a result of lack of manpower or diversion of electric power or scarcity of some raw material. None of these things are actually expected at the moment, but conditions are in the habit of changing.

For many reasons kraft paper fills a highly important need in wartime. Its strength makes it ideal for wrapping purposes and for liners. Research and promotion have greatly widened its use. Though there was a rapid adoption of kraft for shipping containers in preference to wood, the industry anticipated a greater demand than actually developed. As a result manufacturing facilities were greatly extended, particularly in the Southern United States. This resulted in a certain amount of "dumping" in the Canadian market.

Picture Completely Changed

Then the whole kraft marketing picture underwent a complete change with the outbreak of war. European producers were cut off and the domestic mills found a ready market for all they could produce. Normally, Canadian kraft mills carry on a small export business. During the past two years export business has been of record proportions, the demand from Britain being exceptionally high. British South Africa also has greatly increased its purchases and a demand arose for all the kraft Canadian mills could make.

At the beginning of this year it was necessary to distribute the available tonnage on an allotment basis so as to secure equitable distribution to customers. The manufacturers also set up a committee to see that the government and war requirements are served first. In addition, unnecessary colors and uneconomical weights have been discontinued, so as to make for the maximum use of available tonnage. Wartime demand for kraft has brought about a marked improvement in the position of the operators. The great increase in sales has added greatly to revenues with a resultant improvement in finances.

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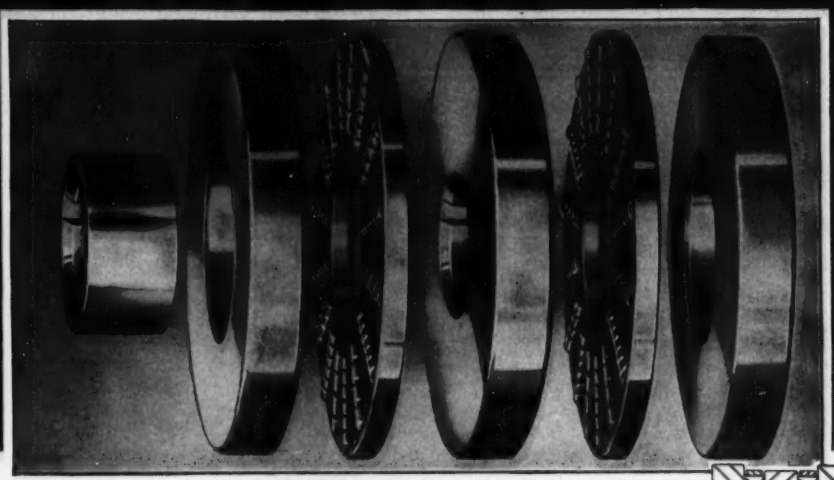

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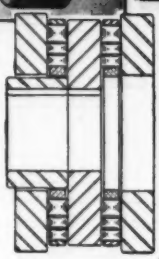

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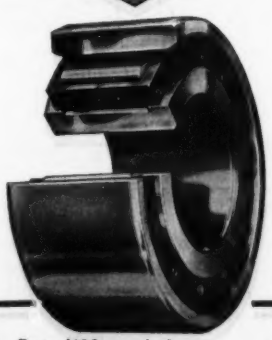

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Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 23, 1942 — The Government Printing Office has received the following bids for 252,582 pounds of 40 x 53 offset book paper: R. P. Andrews Paper Company, 5.5 cents per pound; Walker-Goulard-Plehn Company, 5.17 cents; Marquette Paper Company, 5.97 cents; Mudge Paper Company, 5.67 cents.

For 104,300 pounds of 35 x 45 white supercalendered book paper: R. P. Andrews Paper Company, 5.73 cents; Butler Company, 5.98 cents; Central Ohio Paper Company, 5.39 cents; Marquette Paper Company, 5.71 cents; Mudge Paper Company, 5.6 cents; Paper Corp. of U. S., 6.12 cents; Frank Parsons Paper Company, 5.73 cents; Stanford Paper Company, 5.99 cents; Wilcox - Walter - Furlong Paper Company, 5.35 cents; Bradner Smith & Co., 5.2933 cents; Bulkley, Dunton & Co., 5.73 cents; Mead Sales Co., 5.5 cents; Bermingham & Prosser Co., 5.3 cents; and Coy Hunt & Co., 5.335 cents.

For 106,400 pounds of 36 x 45 white machine-finish book paper, bids per pound received were: R. P. Andrews Paper Company, 5.67 cents; Butler Company, 5.74 cents; Central Ohio Paper Company, 5.14 cents; Marquette Paper Company, 5.48 cents; Mudge Paper Company, 5.35 cents; Paper Corporation of U. S., 5.12 cents; Frank Parsons Paper Company, 5.43 cents; Perkins-Goodwin Company, 5.44 cents; Stanford Paper Company, 5.76 cents; Whitaker Paper Company, 5.54 cents; Wilcox-Walter-Furlong Paper Company, 5.1 cents; Bradner Smith & Company, 5.046 cents; North American Pulp and Paper Corp., 6 cents; Bulkley, Dunton & Company, 5.54 cents; Mead Sales Company, 5.5 cents; Bermingham & Prosser Company, 5.7 cents; Coy Hunt & Co., 5.085 cents; Perkins-Goodwin Company, 6.33 cents.

For 102,000 pounds of 36 x 56 white machine finish book paper, bids per pound received were: R. P. Andrews Company, 5.67 cents; Butler Company, 5.74 cents; Central Ohio Paper Company, 5.14 cents; Marquette Paper Company, 5.48 cents; Mudge Paper Company, 5.35 cents; Paper Corp. of U. S., 5.12 cents; Frank Parsons Paper Company, 5.43 cents; Perkins-Goodwin Company, 5.44 cents; Stanford Paper Company, 5.76 cents; Whitaker Paper Company, 5.54 cents; Wilcox-Walter-Furlong Paper Company, 5.1 cents; Bradner Smith & Company, 5.046 cents; Bulkley, Dunton & Co., 5.54 cents; Mead Sales Company, 5.5 cents; Bermingham & Prosser Company, 5.7 cents; and Coy Hunt & Co., 5.085 cents.

For 308,000 pounds of 42 x 58 poster paper, bids per pound received were: R. P. Andrews Paper Company, 7.35 cents; Butler Company, 6.25 cents; Central Ohio Paper Company, 5.9 cents; Eastern Corporation, 5.75 cents; Marquette Paper Company, 6.74 cents; Stanford Paper Company, 6.25 cents; Paper Corporation of U. S., 5.460633 cents; Walker-Goulard-Plehn Company, Inc., 5.49 cents; Wilcox-Walter-Furlong Paper Company, 6.46 cents; Bulkley, Dunton & Company, 6.74 cents; Mead Sales Company, 6.25 cents; Bermingham & Prosser Company, 6.44 cents; and Resolute Paper Corporation, 6.43 cents.

For 1,000 sheets of 18 x 23 overlay board for chalk overlay process, bids received per sheet were: Whitaker Paper Company, 37.5 cents; Martin Cantine Company, 38.5 cents; and R. P. Andrews Paper Company, 38 cents.

For 80,500 pounds of green sulphite writing paper, 32 x 42, bids per pound received were: Aetna Paper Company, 6.64 cents; R. P. Andrews Paper Company, 6.83 cents; Barton, Duer & Koch Paper Company, 6.83 cents; Butler Company, 6.24 cents; Central Ohio Paper Company, 6.57 cents; Eastern Corporation, 6.12 cents; Marquette Paper Company, 6.83 cents; Mudge Paper Company, 6.25 cents; Old Dominion Paper Company, 6.94 cents; Paper Corporation of U. S., 6.49 cents; Frank Parsons Paper Company, 8.15 cents; Walker-Goulard-Plehn Company, Inc., 6.46 cents; Whitaker Paper Company, 6.79 cents; Wilcox-Walter-Furlong Paper Company, 6.92 cents; Bradner Smith & Co., 7.17 cents; Bulkley, Dunton & Co., 6.5 cents; Mead Sales Company, 6.69 cents; Bermingham and Prosser Company, 6.33 cents; Coy, Hunt & Co., 6.648 cents; and D. L. Ward Company, 6.93 cents.

Gair Old Timers To Meet

The tenth annual banquet of Gair Old Timers will be held in the Grand Ballroom of the Hotel New Yorker, New York City, on Saturday evening, October 17, 1942.

This association was formed in 1933 in memory of Robert Gair and its membership is composed of over one hundred men who are employed by Robert Gair Company at present, or who were formerly associated with that company for a period of five years. To the best of our knowledge, it is the only organization of its kind and is most unique in that there are no benefits other than the good fellowship of being held together by an annual meeting in the form of a banquet which assures a personal get-together once a year. A gala affair will be held this year celebrating the tenth anniversary of its existence.

Officers are elected at each annual meeting. The officers for this years are: Honorary President, Frank G. Wasgatt, retired; President, Walter E. Ringle, Robert Gair Company, Inc.; Vice-President, Charles Burke, Bogota Paper and Board Corporation; Secretary-Treasurer, H. B. Van Antwerp, Sinclair & Valenitne Company.

Eddy Paper Corp. Warehouse Burned

WHITE PIGEON, Mich., September 14, 1942 — Fire believed to have originated from a bolt of lightning during a terrific thunderstorm, caused a fire which raged Tuesday forenoon of last week in the large new steel warehouse of the Eddy Paper Corporation here.

Firemen attempted to get inside at noon but were frustrated by the flames. Corwin H. Drew, manager, who resides in Three Rivers, said there was no way to estimate the amount of damage. The amount involved, it is unofficially stated, will exceed $35,000.

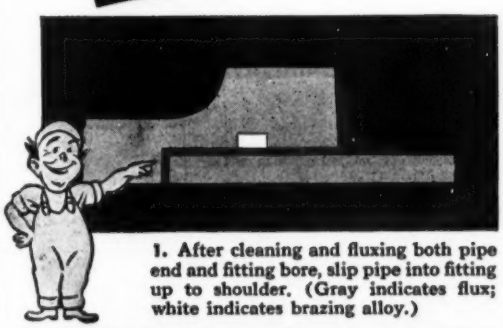
The building was completed only a few months ago, Mr. Drew states. It was filled with a special waste paper stock. The Eddy plant is known as Mill No. 2 of the Eddy Corporation of Three Rivers, and is owned by the Kieckhefer Container Corporation of Chicago and Milwaukee.

HOW TO INSTALL SILBRAZ JOINTS

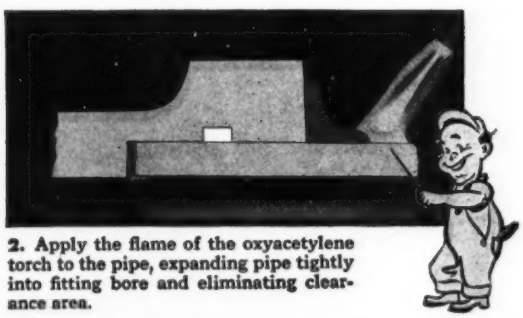
USING WALSEAL VALVES AND FITTINGS

Walseal Valves and Fittings actually make a "one-piece" pipe line when connected by Silbraz joints to copper or brass pipe, copper or copper-nickel tubing. The Silbraz joint cannot creep or pull apart under any temperature or pressure conditions to which the pipe or tubing can be safely subjected. Shock and vibration do not affect it; in fact, the Silbraz joints are the strongest parts of the piping system.

A Silbraz joint is a silver brazed joint —not a soldered joint.

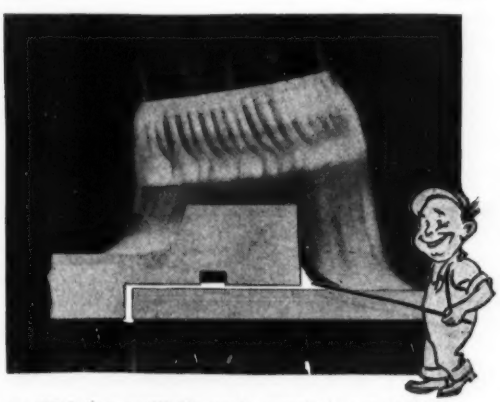


1. After cleaning and fluxing both pipe end and fitting bore, slip pipe into fitting up to shoulder. (Gray indicates flux; white indicates brazing alloy.)



2. Apply the flame of the oxyacetylene torch to the pipe, expanding pipe tightly into fitting bore and eliminating clearance area.

3. With the flame of the oxyacetylene torch directed toward the pipe, apply the heat to a section of the fitting bead, expanding the section and allowing the alloy to flow.



4. With flame still directed toward pipe, and with a wiping motion, heat both section of fitting and pipe for 15 or 20 seconds. Remove flame. Fitting contracts and forces alloy out to form a fillet. Repeat process on adjacent sections until entire Silbraz joint is completed.

THIS IS OUR CENTENNIAL YEAR

This advertisement is a continuation of Walworth's effort to help users of valves, fittings, flanges, and pipe, obtain the maximum benefits from Walworth products, but we would like you to remember that *Walworth has continuously manufactured valves and fittings for 100 years.*

WALWORTH

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

VALVES FITTINGS and TOOLS

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

NEWSPRINT MILLS ASSURED FAIR TREATMENT

(Continued from page 7)

during September, 30,000 more in October and an additional 27,000 during November. Major proportion of these men will be farmers, made available as a result of the agricultural off-season following harvesting operations, it is indicated.

The farmers will be moved to the camps on a voluntary basis, and Elliott M. Little, Director of National Selective Service, will appeal personally, it is understood, to every farmer in Canada. Full assistance of the daily and weekly newspapers will be enlisted in the drive.

The campaign for 110,000 men is expected to bring the present supply of the bush camps of 14,000 men, to 122,000 by "sometime in November," the extra 2,000 being enlisted as a margin of safety to the drive.

Pulp and Paper's Peak Year

Returns just issued by the Dominion Bureau of Statistics show that the year 1941 was the peak year in the pulp and paper industry, new high records being achieved on both the gross and net basis. Rising $36.7 millions, or 12.3%, over 1940, gross value of production at $334.7 millions was far in excess of any previous year. The 1929 figure was surpassed by approximately $90 millions, while the low of the depression years, $123.4 millions in 1933, was exceeded by fully 171.2%. Net value of production, i.e., $174.8 millions, compiled by subtracting the total value of materials and supplies, fuel and electricity from the gross value of production, exceeded the preceding year by 10.5%, 1929 by 43.6% and the 1933 low by 207.4%. The statistics show Quebec maintaining its dominant position in the industry: of 103 mills manufacturing pulp, paper, etc., Quebec alone has 46, against Ontario's 38 and 19 elsewhere. Of some $678.9 million invested capital in the industry, Quebec alone accounts for $359.4 millions and of gross value of production of $334.7 millions Quebec alone accounts for $166.5 millions. Of 37,154 employed in the pulp and paper trades, Quebec accounts for slightly more than half.

	As of Dec. 31, '41	
	Canada	Quebec
Capital employed	$678,937,841	$359,437,012
Salaries and wages	63,677,818	30,580,539
Fuel used	17,722,554	8,424,403
Power employed (hp)	2,032,391	1,098,124
Pulp Manufactured	$175,439,551	$89,103,399
Paper manufactured	241,470,616	124,975,283
Gross value of product	334,746,199	166,578,687
Net value of product	174,872,065	84,287,710
No. employed	37,154	18,670

Curtailment of Power Supplies

Drastic curtailment of the "non-essential" use of hydro-electric power is now being planned to take effect in October. The electricity rationing will be applicable, at the start anyway, only to the central Canada industrial areas served by a "grid" system, which was set up early in the war to link the largest power plants serving Montreal and Toronto districts and other main industrial areas. Under the "grid" system it has been possible to use output of the power systems connected, to maximum potential.

Chief industrial user of power to be affected will be the big newsprint industry. Tonnage allocation will be used to lessen power use for newsprint production in areas of most acute shortage. In other words, so far as possible, Canada's newsprint production will be centered outside the "grid" system area of central Canada—increasing production at newsprint producing centres in New Brunswick, northern Ontario, etc.

Street lighting is to be curtailed, use of electricity for signs and other advertising prohibited and domestic use cut down.

The order applicable to commercial use of electricity is to apply to all Ontario south of a line from Parry Sound to Huntsville to Pembroke, and all the areas in Quebec province served by the following companies: Beauharnois, Shawinigan, Saguenay, Gatineau, Aluminum, Quebec, Southern Canada — and to companies served by these power producers and distributors.

In effect, the area in Quebec affected is all of the province south of the 49th parallel and west of a point just west of Riviere du Loup. The area includes of course the island of Montreal.

"Every power plant in Southern Ontario and Quebec is now working at its greatest capacity consistent with safe and continuous operations," Mr. Howe said in announcing the restrictions.

"Despite this we face a shortage of some 400,000 horsepower in the two provinces and further expansion of our war industries will make the situation that much worse."

The restrictive order is expected to result in a saving of about 140,000 horsepower. If public co-operation makes possible the additional saving of 100,000 horsepower, the remainder of the deficit 160,000 horsepower, will be found by cutting off non-essential users wherever and whenever necessary, the minister's statement said.

Sweet Potatoes in Paper Bags

The first carload of sweet potatoes ever to be shipped in paper bags has just been received by Albers Super Market, Cincinnati, Ohio, who report that both bags and potatoes arrived in good condition and at a considerable saving over other containers. They were shipped by F. H. DeZauche and Son of Opelousas, La.

The car was inspected by the U. S. Department of Agriculture at its destination and the government reported that the contents arrived in good condition, despite the fact that the car was delayed in transit, and the trip took six days. The unloading of the car was witnessed by Neil Furlong of the Union Bag and Paper Corporation, manufacturers of the bags used in this shipment. It was noted that not a single one of the 520 bags loaded in the car was broken.

All the potatoes in this shipment were new sweets of the Porto Rican variety. The bags themselves cost less than other containers and the great difference in weight substantially reduces freight costs. Thus, the consumer gets his potatoes for less and the grower profits through reduced costs and the industry has a proven package that will not be affected by the war.

These bags were developed by the Union Bag and Paper Corporation and were specially constructed for this purpose.

CONSULT VALLEY* *for*

MACHINE ROOM	SLICES, HEADBOXES, HIGH PRESSURE STOCK INLET AUXILIARY SLICES PAPER DAMPENERS PAPER WATER MARKERS
BEATER ROOM	SUTHERLAND REFINERS SMALL JORDANS BEATERS, WASHERS, BREAKER BEATERS CONTINUOUS BEATERS, PULPING ENGINES BROKE BEATERS, BROKE KNEADERS BEATER ROLLS—OPEN OR CLOSED TYPES
FINISHING ROOM	ROLL HEADERS
PULP MILL	KRAFT WASHING SYSTEM FLAT SCREENS ROTARY SCREENS HAND BARKERS & AUTOMATIC ATTACHMENT WOOD SPLITTERS DECKERS, SLUSHERS, WET MACHINES SCREW PRESSES
SPECIALTIES	LABORATORY EQUIPMENT SEMI-COMMERCIAL SCALE EQUIPMENT PLUG VALVES

VALLEY

IRON WORKS COMPANY

APPLETON, WISC.

★ The war program has made it virtually impossible for us to supply new equipment or major repair items to our customers in the industry. But wherever possible, we want our paper mill friends to consult us for engineering service, practical information, or help of any kind in regard to our products.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Joseph J. Aid, technical service department, the Mead Corporation, Chillicothe, Ohio, a 1940 graduate of Miami University.

Harold A. Deery, project chemist, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash., a 1940 graduate of the University of Washington, received his M. S. degree from the New York State College of Forestry in 1941.

Harold L. Field, student, New York State College of Forestry. At present Mr. Field is in the U. S. Army, 2nd Lieut., Chemical Warfare Service, Fort Washington, Md.

Lewis G. S. Hebbs, partner, Cross & Bevan, 3 and 4 New Court, Lincoln's Inn, London, W. C. 2., has been reinstated as an Active Member.

Reginald H. Hurst, research chemist, Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich., a 1926 graduate of Western Michigan College.

Arthur S. Kadzielawa, chemist, Pacific Mills, Ltd., Ocean Falls, B. C., a 1939 graduate of the University of British Columbia.

James M. Kahn, field engineer, Infilco Inc., 325 W. 25th place, Chicago, Ill., attended the Armour Institute, Chicago.

Ernest C. Manders, chemist, Pacific Mills, Limited, Ocean Falls, B. C., a 1941 graduate of the University of British Columbia.

Donald R. Myers, research engineer, Battelle Memorial Institute, 505 King Avenue, Columbus, Ohio, a 1935 graduate of Ohio State University, received his Ph.D. degree in 1940.

Edmund Pearlman, manager and purchasing agent, National Paper Corporation, Ransom, Pa., a 1941 graduate of New York University, and formerly with the Centaur Paper Mills Supply Corporation, Brooklyn, N. Y.

Lester H. Peterson, chemist, Celanese Corporation of America, Cumberland, Md., a 1942 graduate of New York State College of Forestry.

Robert J. Seidl, chief chemist, Merrimac Paper Company, Inc., a 1940 graduate of the University of Wisconsin.

Richard John Servis, chief chemist, Salvo Chemical Corporation, Rothschild, Wis., a 1937 graduate of Polytechnic Institute of Brooklyn.

William Bond Wheelwright, advertising counsellor, Callaway Associates, 210 South street, Boston, Mass., has been reinstated as an Associate Member.

Natural and Synthetic High Polymers

The fourth of a series of monographs on the chemistry, physics, and technology of high polymers has just been issued by the Interscience Publishers. It is entitled "Natural and Synthetic High Polymers," and was originally written by Kurt H. Meyer, professor of organic chemistry, Univ. of Geneva, Switzerland, and recently translated by L. E. R. Picken and J. E. Woods.

In this 700 page book (180 illustrations) an attempt is made to give a systematic account of the entire field of natural and synthetic, inorganic and organic high polymers. Of particular interest to research men in the paper and pulp industries are the chapters on cellulose and its derivatives, starch and related carbohydrates and the proteins. Other chapters cover such subjects as polymerization reactions, rubber and synthetic rubbers, determination of molecular shape and arrangement, chain polymers, polymeric ethers, esters, sulphides, etc., phenolic plastics, aniline plastics, aldehyde resins and condensation products, cellulose breakdown, lignin, pectins, films, foils and membranes.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y., at $11.00 per copy.

Chicago Paper Co. Issues Catalog

Probably the first paper catalog to be published after the W. P. B. Limitation Order of July 24 is the Chicago Paper Company's Catalog dated September 1.

In explanation of this timely distribution of so complicated a job, it might be cited that Chicago Paper Company had been revising its complete catalog for some time prior to July, and was just about ready to publish when notice of the limitation order came through. The catalog was then held up to include all changes necessary by the W. P. B. order.

The Chicago Paper Company's new catalog includes a supplementary section which explains the limitation order and shows other pertinent information which makes selection of papers easy for the buyer.

The new catalog lists all items now in stock which, of course, may be sold as long as Chicago Paper Company and its mill connections have such items available: and also lists on supplementary sheets such items as will no longer be obtainable after such stocks are exhausted. The new catalog, designed for war time buying, will be mailed all customers in the Chicago area.

Paper Inventory Index Higher

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 21, 1942—Index of value of paper manufacturers' inventories in July was 151.3 compared with 149.7 in June, and 122.1 in July last year, taking the average month in 1939 for the index of 100, according to a monthly survey by the Department of Commerce.

July index of value of paper manufacturers' shipments was 125 compared with 139 in June, and 147 for July a year earlier, also using the 1939 average month at 100.

Cincinnati Cordage Gets Warehouse

DAYTON, OHIO, September 21, 1942—The Cincinnati Cordage and Paper Company is moving part of its stock into an addition of a building at Stratford avenue, just completed and leased from Hillsmith & Co., 108 E. Third street.

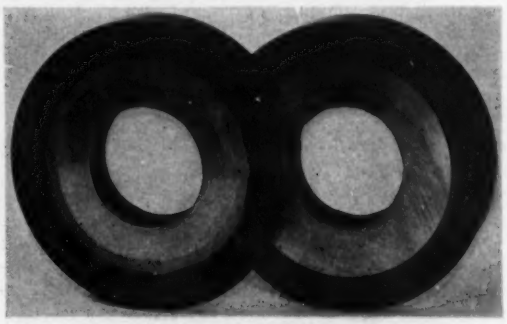
The addition makes the third storage building used by the paper company, since the army took over the building it had used for many years at 535-537 E. Third street.

Other storage localities are at Main and Bruen streets, and at Fifth and Perry streets.

New Goodrich Press Roll

Of special interest now, since the new WPB limitation on rubber covers of paper mill rolls, is the formal announcement by The B. F. Goodrich Company of its steel jacketed, Vulcalock process rubber covered press roll. The company believes this product embodies one of the most important recent advancements in paper mill press roll manufacture. It has been installed in many of the leading mills, but not announced officially until now.

The new roll has many advantages, among which



CROSS SECTION OF THE NEW TYPE IS SHOWN ON RIGHT WITH A CROSS SECTION OF THE OLDER-TYPE CONSTRUCTION ON LEFT.

is an average saving of about 25 per cent in the rubber needed to cover the press roll. By the use of the steel jacket the roll can be held to its original finished diameter, having the same amount of cushion rubber as before, but using less rubber, through elimination of the hard rubber base used in the other type construction.

In the new process, a shell of ordinary steel is welded to the iron core of the roll, and the rubber covering applied on the surface of the steel shell. To prepare the core, all traces of the old cover, if it is being recovered, are removed on a lathe, care being taken to turn the surface concentric and parallel with the journals.

Angular grooves, approximately ½ inch wide and ⅛ inch deep are cut in the surface approximately an inch from the end, for venting away the gases which form in the core when the rubber is vulcanized. Each of the grooves has two ⅛ inch holes spaced 180 degrees apart which connect the vent grooves to the circulation portholes in each head. Over this core two accurately formed steel sheets are welded longitudinally, so they shrink around and practically form an integral part of the core. They are slightly longer than the core face and are turned off to the same length when welding is completed.

After the welded seam is ground to eliminate the raised bead, the steel surface is cleaned thoroughly by shot-blasting and the Vulcalock cements applied, sufficient time given to allow the solvents to escape, and the rubber covering then put into place.

The following advantages are included in the new press roll: Elimination of cotton venting strings used in the standard construction, with their possibility of producing corrugations. Absolute bond between rubber and metal. Closer control of vulcanization time and temperature. Uniform density and end anchors. More usable cushion rubber, resulting in longer life.

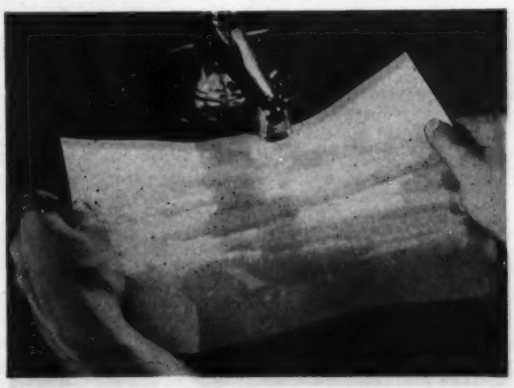
New Aqualized Paper Fabric

A significant aspect of the war time search for substitutes is the use of paper to replace priority materials. One of the most interesting and thought provoking papers yet developed is aqualized paper, a product of Brown Company, which is being hailed as a substitute for cloth and burlap.

The name "Aqualized" was suggested by the paper's amazing strength when wet, a feature not found in ordinary papers which tend to lose strength and disintegrate in contact with water. By means of an exclusive process the individual cellulose fibres in the paper are effectively interlocked and fastened, giving an inherent wet strength all the way through the sheet that is independent of any coating or sizing on the surface of the paper. Some types of Aqualized paper are highly absorbent, other types, on the contrary, are made to repel water.

Paper will have to fill many gaps caused by war time scarcities. For example, it is known that the Germans have already utilized paper for clothing, pup tents, handbags and camouflage. Aqualized paper, with its high wet strength lends itself to just such type of use and is already being impregnated or coated by converters for many war applications. Aqualized paper also fills an important place in the food field where a wet strength paper is required. These uses include potato bags, crate liners, loin wraps and locker bags for frozen foods to mention a few.

Many paper engineers are conducting their own



NEW PAPER HAS INHERENT WET STRENGTH

experiments with this unusual new paper. Others are working with Brown Company's Research Laboratories to develop a product for their needs. Samples of Aqualized paper and complete information may be obtained from Brown Company's General Sales Office at 500 Fifth avenue, New York City.

Racquette River Raises Flag

POTSDAM, N. Y., September 21, 1942—The Racquette River Paper Company was the scene of a recent ceremony at which a flag showing that more than ninety per cent of the employes have subscribed for war bonds was dedicated. The company is now employing about 405 persons and virtually all participated in the ceremony. The flag was raised by an official of the concern. The company has inaugurated the voluntary payroll deduction plan for the benefit of its employes.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Richmond, Va.—The Randolph Paper Box Company, 1313 East Grace street, manufacturer of folding paper boxes and containers for the drug trade and other kindred lines of industry, has arranged for the establishment of two new branch plants for large increase in present output. A building on East Franklin street, in vicinity of present plant, has been secured under lease and will be equipped and placed in service at early date. Facilities will be installed for employment of about 100 operatives. Another industrial structure at Victoria (Lunenberg County), likewise has been acquired and will be used for the second branch plant noted. Equipment and facilities will be provided for about the same number of employes as the East Franklin street plant. It is proposed to have both plants in service in October. Present factory will be continued in operation as heretofore. This expansion follows the recent incorporation of the Randolph Paper Processing Corporation, with capital of $50,000, by Roy P. Bumpass, president and general manager of the Randolph Paper Box Company, and associates. It is understood that the two new branch plants will be identified with the new organization, and will be equipped with facilities for processing and converting as proposed by the new company.

Tacoma, Wash. — The Standard Carton Company, 2611 Pacific avenue, manufacturer of folding paper boxes and containers, has completed plans for new one-story addition to plant for expansion in production department. No estimate of cost announced. General erection contract has been awarded to Calvin J. Kirk, Tacoma, and work will be placed under way at once.

Boston, Mass.—The Poverman Corrugated Box Company, Inc., has been chartered with capital of 500 shares of stock, no par value, to manufacture corrugated boxes and containers. New company will take over and succeed to the organization of same name, with plant at 75 Wareham street. Expansion is planned. Julius Poverman is president and treasurer of new company.

Detroit, Mich.—The Detroit Sulphite Pulp and Paper Company, 9125 West Jefferson street, manufacturer of wrapping, tissue and other paper stocks, is awarding miscellaneous sub-contracts for new steam power house at mill, previously referred to in these columns. Work on new building is being placed in progress. W. J. C. Kaufmann Company, 10610 Shoemaker street, Detroit, has the general erection contract.

New York, N. Y.—The A. B. C. Fiber Corporation, East 149th street and East Rixer, waste paper products, has leased a two-story building at Ninth avenue and 216th street, and will occupy for expansion in storage and distributing facilities. Structure will be taken over at once.

St. Louis, Mo. — The Ajax Corrugated Paper Company, 6260 North Broadway, manufacturer of corrugated paper boxes and containers, corrugated roll paper, etc., has arranged for lease of an industrial building at 10th and Mullanphy streets, and will occupy for expansion, including manufacturing department, and storage and distributing divisions. It is understod that present plant will be removed to new location at early date.

Cincinnati, Ohio — The Liberty Paper Stock Company, 1093 West Liberty street, commercial paper products, is arranging contract awards for immediate erection of proposed new addition at Liberty and Dalton streets, covering a number of sub-contracts for different features of work. As previously noted in these columns, new structure will be used for storage and distributing service. Leslie Moss, 4109 Heyward street, Cincinnati, is architect.

New York, N. Y. — The International Paper Company, 220 East 42nd street, is perfecting a new type of corrugated paper citrus fruit container at its research laboratories, and it is said that new product will be placed on market at early date. The container is of acid-proof type, designed to replace crates previously used for this purpose, and which will withstand cold storage warehouse service successfully.

Mount Denis, Ont. — The Dominion Cellulose, Ltd., 347 Bay srteet, Toronto, Ont., manufacturer of cellulose products, is considering plans for construction of new mill in vicinity of Mount Denis.

Temiskaming, Que. — The Canadian International Paper Company, Sun Life Building, Montreal, Que., has approved plans for new one-story addition to mill at Temiskaming, specializing in wood cellulose production. General contract for erection has been awarded to Bennett-Pratt, Ltd., 30 Bloor street, West, Toronto, Ont., and work is scheduled to begin at once.

New Companies

New York, N. Y. — The Montmorency Paper Company, Inc., has been chartered with capital of $250,000, to manufacture and deal in paper products of various kinds, paperboard, etc. New company is represented by Mitchell, Taylor, Capron & Marsh, 20 Exchange place, New York, attorneys.

Boston, Mass.—The Atlantic Paper Company, 596 Atlantic avenue, has filed notice of organization, to deal in paper products of various kinds. New company is headed by George W. Taylor, Jr., 249 Crafts street, Newtonville, Mass.

Brooklyn, N. Y.—The Utility Paper Products, Inc., has been organized with capital of 100 shares of stock, no par value, to deal in paper goods of various kinds. New company is represented by Benjamin Jaffe, 11 West Forty-second street, New York, attorney.

Paper Containers for Fruit Industry

VANCOUVER, B. C., September 19, 1942—Corrugated cardboard containers may be introduced this year for the first time in packing British Columbia apples. Prospects of a heavy crop in the Okanagan, coupled with the threat of wooden box shortage, may encourage this experiment and if negotiations now under way are acceptable to the growers' associations about 750,000 cardboard boxes may be used to relieve the emergency.

The Okanagan Valley expects a harvest of more than 6,000,000 boxes this year, although present indications are that only about 4,500,000 boxes will be readily marketable. Reports from Vernon and Kelowna indicate that the supply of wooden boxes, as a result of difficulties in getting adequate stocks of box shooks and labor, may be sufficient for only about 90 per cent of the pack.

The extent to which Vancouver cardboard box companies are able to supply the demand will depend to some extent on the style of container required by the industry, but one manufacturer here is reported ready to supply a limited number of strong, serviceable corrugated boxes identical in size and capacity to the commonly used wooden boxes.

Another Vancouver company is experimenting with the production of cardboard or paper containers for apple and other fruit juices and, although several technical problems have been encountered, it is hoped to find a means of providing a suitable substitute for cans. The use of tinplate in packing fruit juices has been severely restricted by government regulations.

Efforts to introduce cardboard in various forms to the agricultural industry have been repeatedly made in the past, but with limited success although the demands on the wooden box factories and all other divisions of the lumber industry have been so great in recent months that the prospects of changing the growers' packing habits seem better today than ever before. In the old days when the wooden box was supreme, skeptical growers were inclined to believe that there could be no satisfactory substitute, but necessity disregards tradition.

Manufacturers of cardboard boxes will welcome development of a market in the fruit industry because they lost much of their sale with the canned fish trade this year due to the fact that the United Kingdom, which is absorbing the entire salmon and herring pack, insists on wooden boxes. When canned fish was shipped to Australia, South Africa and the domestic market, cardboard was extensively used.

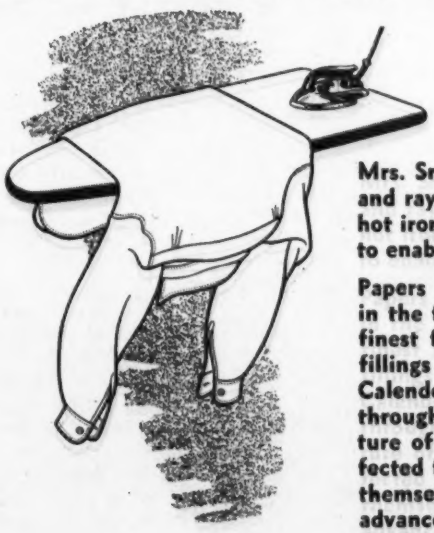
Brand-New Penny Folder

A novel advertising folder, emphasizing the value and features of Gilbert Ledger, has just been produced by the Gilbert Paper Company, Menasha, Wis.

The cover of the folder carries an actual brand-new penny, with which is associated a thin line representing the fractional-penny additional cost of Gilbert Ledger over papers without a cotton fiber content. The inside pages of the folder present a quick, concise word-and-picture story of Gilbert Ledger advantages—low prices, efficiency in operation, tough surface, durability, and long life.

Gilbert Ledger now represents the 25% select-cotton-fibre-content grade in the Gilbert line of ledgers, having replaced Gilbert Dispatch Ledger and Gilbert Entry Ledger.

Mrs. Smith knows something about your Finishing Problem!



Mrs. Smith cannot iron cotton and woolens the same way she does silks and rayons. Each fabric has its own finishing requirements, some need a hot iron, some a cool one. The padding on her board must be soft enough to enable her to do nice smooth work, free from wrinkles.

Papers have individual characteristics, too. So the degree of resilience in the filled rolls must be just right for the paper in order to obtain the finest finishing results. We have continually enlarged our selection of fillings to include the exact type for each application. Appleton Super-Calender Rolls offer you the full range of density from soft cotton through to the hardest paper rolls. New developments in the manufacture of paper have presented new operating difficulties. We have perfected fillings to fit the job. New materials are being produced that lend themselves to roll construction. We take advantage of every technical advancement to build longer service and better finishing qualities into Appleton Super-Calender Rolls. In our complete selection we have the right filling for your papers on your rolls for your calenders—no matter how difficult or how different your finishing problem may be.

THE APPLETON MACHINE COMPANY
APPLETON WISCONSIN

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending Sept. 19, 1942

STOCKS

	High	Low	Last
A. P. W.	1¼	1¼	1¼
Armstrong Cork Co.	26½	25¾	26½
Celotex Corp.	6¼	6⅛	6¼
Celotex Corp., pf.	68½	68	68½
Certain-Teed Products Corp.	2	1¾	2
Certain-Teed Products Corp., pf.	25¼	24½	25¼
Champion Paper & Fibre Co.	15¾	15¾	15¾
Champion Paper & Fibre Co., pf.	95	95	95
Congoleum Nairn Co.	16½	16½	16½
Container Corp. of America	12½	12½	12½
Continental-Diamond Fibre Co.	6	6	6
Crown-Zellerbach Co.	10⅞	10½	10⅞
Crown-Zellerbach Co., pf.	84¼	84	84¼
Dixie-Vortex Co.	....	....	....
Dixie-Vortex Co.—A	36	36	36
Flintkote Co.	11	10⅝	10¾
Robert Gair	1⅝	1½	1⅝
Robert Gair, pf.	8½	8½	8½
International Paper Co.	8¼	7⅞	8
International Paper Co., pf.	47	45⅜	45⅜
Johns-Manville Corp.	58⅞	57¼	58¾
Johns-Manville Corp., pf.	....	....	....
Kimberly Clark Corp.	26½	25¾	26½
MacAndrews & Forbes	18	17⅛	17⅛
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	26½	26	26½
Mead Corp.	6¼	6¼	6¼
Mead Corp., pf.	66	66	66
Paraffine Companies, Inc.	29	28¾	28¾
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	8⅜	8⅛	8⅛
Rayonier, Inc., pf.	26¼	25½	25¾
Ruberoid Co.	18½	18	18¼
Scott Paper Co.	34½	34	34
Scott Paper Co., pf.	....	....	....
Sutherland Paper Co.	21½	21½	21½
Union Bag & Paper Corp.	7⅞	7½	7½
United Paperboard Co.	3¼	2⅞	3¼
U. S. Gypsum Co.	52	51¼	51¼
U. S. Gypsum Co., pf.	171½	171½	171½
West Virginia Pulp & Paper Co.	12	12	12
West Virginia Pulp & Paper Co., pf.	97	97	97

BONDS

Abitibi Pulp & Paper Co. 5s '53	70	69¾	69¾
Celotex Corp. 4½s '47	97½	96¾	96¾
Certain-Teed Products Corp. 5½s '48	90¾	88½	90½
Champion Paper & Fibre Co. 4¾s '50	104	103½	103½
Champion Paper & Fibre Co. 4¾s '50	105	105	105
International Paper Co. 6s '55	105¼	105	105¼
International Paper Co. 5s '47	104	103¾	103¾
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	104	103¾	103¾

New York Curb Exchange

High, Low and Last for Week Ending Sept. 19, 1942

STOCKS

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	....	....	....
Great Northern Paper Co.	28	28	28
Hummel-Ross Fibre Corp.	3⅛	3	3⅛
National Container Corp.	8¼	8¼	8¼
St. Regis Paper Co.	1¾	1¾	1¾
St. Regis Paper Co., pf.	108½	108½	108½
Taggart Corp.	2⅞	2⅞	2⅞

BONDS

American Writing Paper Co. 6s '61	84	83	83

St. Regis to Pay $1.75

The St. Regis Paper Company has declared a dividend of $1.75 a share on preferred stock, payable on account of accumulations October 1 to stockholders of record September 19. Arrears on October 1 will amount to $70 a share, it is reported.

MacAndrews & Forbes Votes Dividend

The MacAndrews & Forbes Company has voted a dividend of 30 cents a share on the common stock, payable October 15 to stockholders of record September 30. Previous payment was 35 cents, made July 15.

40-Cent Wage Rate Recommended

Establishment of a uniform 40-cent an hour minimum wage rate under the Fair Labor Standards Act in the converted paper products industry is recommended unanimously by a committee for the industry, in a report filed with L. Metcalfe Walling, Administrator of the Wage and Hour Division, U. S. Department of Labor.

The committee, the second for the industry appointed in accordance with the Act, made its recommendation following a one-day meeting. The committee was composed of twenty-one members, equally representative of employers, employees and the public, with William E. Simkin of Philadelphia, Pa., as chairman.

A wage order made effective on June 30, 1941, on the basis of a recommendation by the prior committee provided for the current minimum wage scales of 40, 38 and 36 cents an hour for different branches of the industry.

Before acting on the committee's unanimous recommendation of the 40 cent an hour minimum, the Administrator will schedule a public hearing on the proposal.

Bagley & Sewall Get Revision

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., September 21, 1942—Announcement is made of a revision in the property assessments of the Bagley & Sewall Company following protests made recently by officials of the concern. A reduction of from $100,000 to $90,000 on the Sewall Island property has been made by the city while property on Moulton Street is also reduced from $40,000 to $30,000. Abe Cooper, a prominent business man of Syracuse, purchased the property some time ago after it had been idle and operations have been conducted on a full time basis by the new owners. Reductions sought on other parcels of property owned by the company were not allowed at the meeting but further action is anticipated in the near future.

U. S. Appeals Filter Disk Case

The Government has appealed from the decision of the United States Customs Court that coffee filter disks imported at Los Angeles by W. X. Huber Company are dutiable at 5 cents per pound and 15 percent as filter paper. The disks had been classified for duty as tissue paper dutiable at 6 cents per pound and 20 percent. The United States Court of Customs and Patent Appeals has previously overruled a similar decision by the United States Customs Court and sustained the tissue paper classification.

Gair Co. Declares Dividend

The Robert Gair Company has declared a regular quarterly dividend of 30 cents a share on the preferred, payable September 30 to stock of record September 25.

The War Consultant

A clearing house for consultants has been established to assist industry, large and small, which must produce more and better than ever and under steadily increasing difficulties.

Shortages of raw materials, the need for substitutes and for new products, be they for military or civilian use, and the necessity of reorganizing, adapting and erecting of plants, create unending problems for the manufacturer. He comes to realize that expert advice must be found—yet frequently does not know where to get it.

Therefore, having fully realized this difficulty, the Association of Consulting Chemists and Chemical Engineers, Inc., 50 East 41st street, New York, N. Y. (Tel. LExington 2-1130) has established as one of its functions a Clearing House for Consultants as a free service, referring those who ask for assistance to consultants specializing in any given field.

Michigan Div. Meets

KALAMAZOO, Mich., September 21, 1942—The first fall meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held at the Park American Hotel, Thursday, September 17 with thirty-five present.

Following dinner chairman Neudorf asked for the report of the nominating committee consisting of Arnold Weller, Lester H. LaLiberte and O. W. Cole. The following names were placed in nomination and elected: Alfred B. Perlick of the K.V.P., chairman; Glen Sutton, first vice chairman; Ralph Atkins, second vice chairman and Joe Waber, secretary-treasurer. Retiring chairman Neudorf thanked the members of the committees for their assistance tendered him during his term of office.

Frank L. Brown, the veteran purchasing agent at the Michigan Paper Company, Plainwell, was the speaker using as his topic "Production, Strategy and Purchasing Problems." He explained in detail the tormenting problems encountered by a purchaser for a paper mill, and demonstrated thoroughly that he studies the rapidly changing conditions carefully and gave a most interesting talk on his subject. Those present were:

T. Agronin, Shartle Brothers; Ralph Atkins, Lee Paper Company; Wm. H. Astle, Michigan Paper Company; Henry Bongers, Sutherland Paper Company; L. H. Breyfogle, Draper Brothers; D. D. Bachelder, Sutherland Paper Company; H. C. Bradford, Rex Paper Company; Ray L. Barton, Michigan Paper Company; Frank L. Brown, Michigan Paper Company; W. J. Cassidy, Hawthorne Paper Company; A. W. Cole, Rex Paper Company; S. W. Cooper, Westinghouse Electric Company; Wayne Crotty, Bryant Paper Company; O. W. Callighan, Edgar Brothers; Paul de Gueherv, Michigan Paper Company; C. E. Gardner, Lee Paper Company; Fred Hodgemire, Hawthorne Paper Company; J. A. Heenan, Sutherland Paper Company; Murray Huff, Chicago; H. B. Johnston, Allied Paper Company; Henry Neudorf, Rex Paper Company; A. R. Prout, Corn Products Refinery Company; Chas. B. Rader, A. W. Riedel, Riedel Brush Company; O. R. Smith, Amer. Cynamid Corporation; A. L. Sherwood, Sutherland Paper Company; S. Marshall Smith, Westinghouse Electric Company; C. "Baldy" Smith, Glen Sutton, Sutherland Paper Company; W. S. Taylor, Amer. Cynamid Corporation; Arnold Weller, Sutherland Paper Company; Joe Waber, Rex Paper Company, secretary-treasurer, Michigan Division.

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PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger

EDITOR

Vol. 115 September 24, 1942 No. 13

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Technical Association of the Pulp and Paper Industry, Fall Meeting, Statler Hotel, Boston, Mass., September 29-October 1.

MORE ACTION NEEDED

Immediate and concrete action in the adoption of a broad anti-inflationary program and a comprehensive but sound tax bill are urgently necessary, it is pointed out by Henry H. Heimann, executive manager, National Association of Credit Men, in the association's mid-monthly review of business, issued September 15, to its 20,000 manufacturing, wholesaling and banking members. The multiplicity of recent tax proposals, the credit executive declares, has left tax-conscious citizens in a virtual daze. "The most important piece of tax legislation ever attempted has been beset with tax programs as varied as the winds," Heimann said. "If our military leaders changed their over-all strategy as frequently as tax changes have been proposed there would be little hope for us in the war."

Declaring that tax and inflation programs require action and that the public should be well informed of the full scope of the war effort, Mr. Heimann went on to say that, "This nation at war deserves to know from its leaders and representatives the full scope of the war burden. Through Selective Service, we have a reasonably clear conception of the future manpower needs. We deserve to and must know as much about the calls that we can expect on our financial strength. No single weapon can prevent inflation. It requires many, and above all it requires courage to adopt the broad program that is necessary, and to do this in time, not after the vicious trend has begun. It is idle to speak of checking inflationary tendencies and then eliminate large segments of our economic forces from playing their part in the program. Much has been said against the farm price parity program. The farmer, along with every other citizen, must do his bit. But he is not alone. Millions of wage earners must realize that wages and salaries offer as great a potential source of danger as any single factor. We must make sure that our anti-inflationary program is not branded 'too little—too late.' And in so acting, let us follow the democratic processes laid down by the Constitution for our republican form of government."

In advocating a definite program, Mr. Heimann points out that, "there can be no confusion about some of the facts about our present tax outlook and the type of tax legislation that is needed. First, no one can dispute the fact that the new tax legislation must produce more taxes than any previous tax bill in our history. Second, if we are really serious about this war calling for an all-out effort by everyone, and Heaven help us if we are not, then everybody must pay a tax, and by everybody we must mean those in the lowest income brackets, where the vast new purchasing power is being largely received. Third, in considering a tax bill political consideration must be out. This is a real war, not a political scrap, and we must have a real tax bill in support of war expenditures. Fourth, this country has an income of some 100 billion dollars a year. It is alleged by competent tax analysts that some 70 billions of this income pays no direct federal taxes. The principal reason is that the exemptions and minimum allowances permit so large a share to be non-taxable. It is therefore obvious that some system of taxation that will directly apply to approximately three-fourths of our national income must be a part of any equitable tax bill."

Continuing, Mr. Heimann said: "Fifth, the most economical and assured method of realizing such income is through a withholding tax, or a sales tax, or both. We need such provision in this bill now, not next year. Sixth, in writing any tax bill the rates of federal taxation must not be so high as to amount to confiscation. Business does not desire to make money out of the war but it does feel it essential that no law is enacted that plunges it into bankruptcy through taxation or cripples it so that recovery in normal times is impossible without complete amputation of management. Seventh, whether or not the specific Ruml plan is the answer, the need for a current discharge of current tax debt is imperative. Without this type of program of tax liquidation, business and individuals are left in confusion and practically give to the government a blank check. It may have been less important in a peace-time tax bill with its lower rates. In a war-time bill it is imperative. Eight, while taxes must be levied where the income is to be found, there is no reason why the meek and unorganized or the patriotic and inarticulate should be carrying more than their share of the load. The middle man can eventually have his patience tried to the breaking point."

In concluding, Mr. Heimann called attention to

the urgent need for action, stating that, "Any delay of a sound tax bill due to political expediency or class favoritism or blind intolerance to an alternate plan of taxation merely because it is new, is a definite hindrance to the war effort, far beyond the amount of taxes involved, because it keeps the minds of men and women so absorbed in trying to analyze what taxes may be in store, that the reserve energy so essential to a successful prosecution of the war is channeled away through indecision and uneasiness."

Paper Customs Decisions

A considerable number of cases involving the dutiability of rice paper squares from Japan, have been suspended in the United States Customs Courts at various ports for the duration of the war, according to the Import Committee of the American Paper Industry. Inasmuch as the merchandise was shipped from Japan the importers decided not to risk trial of the cases in the courts at this time. All such protests might be dismissed on the ground that alien importers of merchandise from countries with which the United States is at war have no rights in the civil courts.

The classification of imitation kraft paper, composed of 60 percent sulphate pulp, the balance of sulphite and ground wood, is under study by Customs officials. The importer claims this paper, shipped from Canada, is entitled to admission at the rate of 20 percent provided under the Finnish Reciprocal Trade Agreement for kraft wrapping paper. The Customs officials believe the paper may be properly dutiable as other wrapping paper, at 25 percent.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1942		Corresponding Weeks—1941	
August 8	81.5	August 9	99.7
August 15	79.8	August 16	99.0
August 22	80.5	August 23	102.8
August 29	82.8	August 30	102.4
September 5	83.2	September 6	84.8
Sept. 12. (Holiday Week)	*71.2*	September 13	104.2

* Preliminary

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	104.5	103.9	102.9	100.3	95.4	87.3	75.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	*81.2*	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date..	68.4	77.9	86.4	68.9	78.8	86.2	94.5	92.7
Year Average..	69.9	80.4	79.8	71.5	83.4	85.6	97.4	....

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where obth paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	93	82	72	68	75	..	..	..	..	..

Week ending Aug. 8, 1942—75
Week ending Aug. 15, 1942—73
Week ending Aug. 22, 1942—74
Week ending Aug. 29, 1942—77
Week ending Sept. 5, 1942—78
Week ending Sept. 12, 1942—65

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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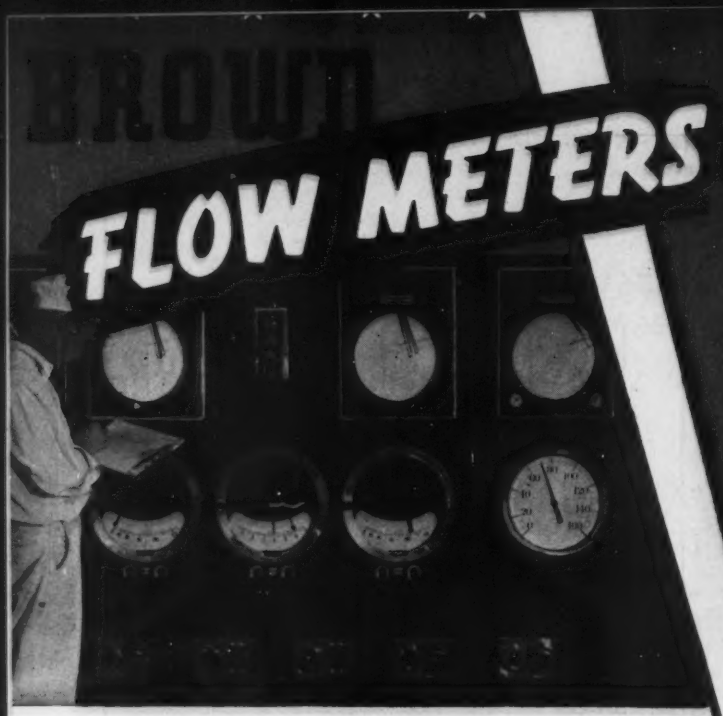

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Spiractor—The New Sludgeless Cold Lime-Soda Water Softener

By Howard L. Tiger[1] and Martin E. Gilwood[2]

Abstract

This new type of cold lime-soda water softener embodies a revolutionary principle—catalytic precipitation. The chemically treated water passes upwardly through a bed of catalyst granules contained in a conical device so that the velocity of the water decreases continuously as it rises through the Spiractor. The immediate contact of the treated water with the granules of catalyst accelerates precipitation of the calcium and magnesium compounds, and these precipitates form hard crystalline shells or accretions on the granules rather than precipitating in the form of fine turbidity which must be settled out of solution. As a result of the accretions, the granules grow in size and are disposed of periodically by simply drawing them off through a drain valve located at the lower extremity of the cone, fresh catalyst being added at such time through the top of the cone. This permits easy disposal of the precipitated hardness in the form of solid granules rather than in the form of voluminous watery sludge.

The reactions proceed at very high speed so that the total detention period in the Spiractor is only 5 to 10 minutes as compared to 1 hour even in the most modern types of precipitators.

The modern trend towards streamlined operation with maximum output from equipment occupying minimum space is clearly illustrated in the development of the Spiractor, the latest addition to modern cold lime or lime-soda water treatment processes and equipment. This equipment was invented by E. T. Zentner in Czechoslovakia some five years ago, and the design and process are covered by issued and pending patents in various countries. During the intervening years, the process has been developed and perfected and tested on a large scale, and a number of installations are in successful operation in several European countries and in the United States.

Spiractor Applies Established Principles in New Way

The fundamental reactions for the precipitation of Ca and Mg salts from water may be summarized for convenience in the following brief form:

$$Ca(HCO_3)_2 + Ca(OH)_2 \rightarrow 2\ CaCO_3 + 2\ H_2O \quad (1)$$
$$Mg(HCO_3)_2 + 2\ Ca(OH)_2 \rightarrow 2\ CaCO_3 + Mg(OH)_2 + 2\ H_2O \quad (2)$$
$$MgCl_2 \text{ or } MgSO_4 + Ca(OH)_2 \rightarrow Mg(OH)_2 + CaCl_2 \text{ or } CaSO_4 \quad (3)$$
$$CaCl_2 \text{ or } CaSO_4 + Na_2CO_3 \rightarrow CaCO_3 + 2\ NaCl \text{ or } Na_2SO_4 \quad (4)$$

The two precipitates $CaCO_3$ and $Mg(OH)_2$ are relatively insoluble, and thus the bulk of the Ca and Mg ions are precipitated out of solution in this form. However, some of the Ca and Mg ions are left in solution for the following reasons:

(a) The precipitates have certain theoretical solubilities which are approximately as follows:

(Figures expressed as p.p.m. in terms of $CaCO_3$, temp. 25 deg. C.)

Total CO_3^{--} (causticity = 0)	Solubility of $CaCO_3$	Total causticity * (M.O. alk. = 50)	Solubility of $Mg(OH)_2$
10	14	0	33
20	3	5	20
40	2	10	13
80	2	15	8
100	1	20	6

* Causticity = 2 × phen. alk. — M.O. alk.

(b) Equilibrium is not attained in practice in the time available—i.e. considerable $CaCO_3$ and $Mg(OH)_2$ is left in solution in excess of these theoretically soluble concentrations.

In an attempt to approach the residual hardnesses corresponding to the theoretical solubilities, the old-style conventional type of continuous cold lime-soda softener is usually designed for a 4-hour detention period. Also in larger and more carefully designed plants, extended mechanical agitation is included to hasten the reactions. In spite of these facts, however, such plants deliver effluents containing about 80 to 100 p.p.m. hardness instead of the hardness corresponding to the theoretical solubilities.

It has been known for years past that agitation of the treated water with the accumulated precipitates in the form of sludge further accelerates the reactions, and that principle is employed in the cold intermittent lime-soda softener. Such units deliver effluents of about 50 to 70 p.p.m. hardness which more nearly approaches the theoretical solubilities. However, these units are costly, occupy much space, and require considerable operating control, and this design therefore has been abandoned to a substantial extent.

More recently, there has been developed a cold continuous sludge-contact type of precipitator (such

[1] Vice President in Charge of Research & Development, The Permutit Co., New York, N. Y.

[2] Chemical Engineer, Research Department, The Permutit Co., New York, N. Y.

as the Spaulding precipitator) which incorporates the positive agitation of the treated water with accumulated precipitates or sludge. Such units, designed for a 1-hour detention period, approach the theoretical equilibrium solubility values more closely than is possible even with a 4-hour detention period in the old-style conventional type of lime-soda water softener. Therefore this type of equipment is much smaller and it delivers an effluent containing only 50 to 70 p.p.m. total hardness when full lime-soda treatment is used. Furthermore this effluent has much better stability—i.e. difficulties from after-reactions resulting in the formation of further precipitates are practically eliminated.

The Spiractor goes a step further: It recognizes the principle of intimate contact with solid nuclei for accelerated precipitation, but it is so designed and operated that such contact is achieved with nuclei in the form of relatively large particles so that three new results are obtained:

(a) The precipitates accumulate as skin formations or accretions on these granules instead of as relatively fine independent suspensions.

(b) The granules with their accretions are so large and heavy that they can be separated from the water at relatively high flow rates, and

(c) The precipitated hardness instead of accumulating as watery sludge is collected in the form of enlarged granules which can be readily disposed of as one might dispose of moist sand grains.

TABLE I

	Detention time, hours	* Approx. total hardness of effluent, p.p.m. as $CaCO_3$	Waste sludge or granules, % solid matter	Stability of final effluent
Old-style conventional type precipitator....	4	80—100	1—2	unstable
Sludge-contact type precipitator	1	50—70	4—5	stable
Spiractor	0.1—0.2	50—70	95—98	stable

* These are the usual results in the cold with full lime-soda treatment and substantial excesses of chemicals; where lime alone is used or with lower excesses, the effluent hardnesses are correspondingly higher.

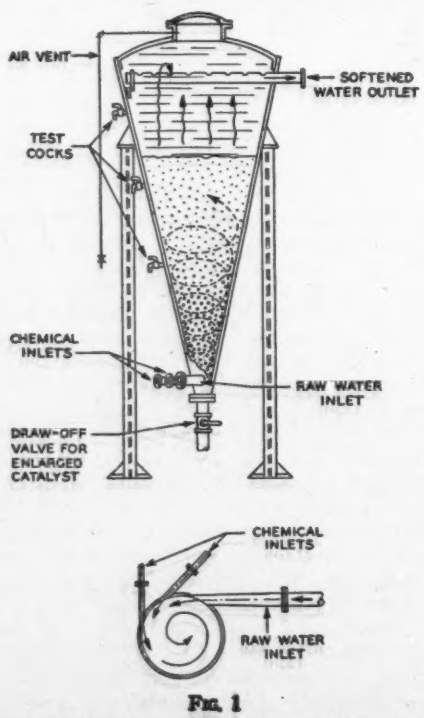

FIG. 1

Cross-Sectional View of Permutit Spiractor Showing Flow. Inset Gives Detail of Arrangement of Raw Water and Chemical Inlets.

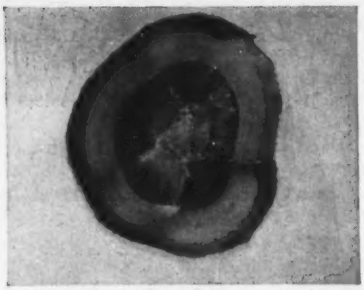

FIG. 2

Enlarged Cross Section of Catalyst Granule after Accumulating Deposits

Table I summarizes these facts with respect to the various types of cold continuous lime-soda treating equipment in convenient form:

Design and Operation

Figure 1 is a cross-sectional view of a pressure unit. The device consists essentially of an inverted conical container more than half filled with fine granules of the calcium carbonate catalyst (about 0.1 to 0.2 mm. grain size). The hard water and the lime-soda precipitant enter the bottom of this cone adjacent to each other and immediately mix together as the treated stream of water rises through the granular catalyst bed. The inset on Fig. 1 shows in plan view how the chemicals and water enter tangentially through the inlet fitting at the bottom. This tangential introduction imparts an upward swirling motion to the stream of water as it rises through the Spiractor, from which motion the device takes its name. This swirling, spiral motion insures thorough and uniform contact between the catalyst granules and the treated water. The flow rate is made high enough to maintain the granular bed in a suspended condition and low enough to avoid carrying any of the granules out of the conical container.

The immediate contact between the chemically-treated water and the suspended catalyst granules greatly accelerates the softening reactions as described above. The resultant relatively insoluble reaction products are thus formed while the water is still in contact with the granules and consequently deposit on the surface of those granules in the form of successive adherent layers—i.e. accretions. In fact, a cross section of one of these granules after it has grown has the same sort of ring-like structure that one sees in the cross section of a tree. This is clearly illustrated in Fig. 2, which shows a cross section of such typical granules after precipitates have been deposited on the surface.

Agglomeration of the granules into compact masses such as occurs in downflow filters receiving unneutralized lime-soda treated influents, does not occur here because, as stated above, the catalyst bed is maintained in a suspended condition. Thus the granules are always in motion and cannot be cemented to each other by the newly formed reaction products.

Fig. 1 shows only the Spiractor unit proper. A typical arrangement of a complete installation with chemical feeds and filters is shown in Fig. 3. This shows a pressure unit, in which the water passes un-

der pressure directly through the Spiractor and the filters to service. Where conditions are suitable, the Spiractor may be designed as an open gravity unit, in which event it is necessary to repump to service. However, the method of operating under pressure and eliminating repumping is advantageous in many cases.

As stated above, it is necessary to operate the equipment at a flow rate which is high enough to suspend the catalyst bed and low enough to avoid carryover of the catalyst granules. Therefore, in practice, the equipment is arranged to operate at a constant maximum rate of flow which somewhat exceeds the average treated water requirement. The storage tank floating on the service line takes care of the variations in requirements, and the equipment is usually arranged with a float switch in this storage tank which shuts off the chemical feeds in synchronism with the raw water when the storage tank is filled and starts the flow of raw water and chemicals again when the water level in the storage tank drops to a predetermined point.

As the water continues to pass through, the accretions on these granules cause them to grow in size and cause the total catalyst bed volume to increase proportionately. In normal operation, the unit (*see* Fig. 1) is filled with sufficient catalyst so that, when the plant is operating, the expanded catalyst bed will be just above the level of the second test cock. As the bed volume increases and reaches the top test cock, a portion of the coarsest enlarged catalyst granules is removed through the drawoff valve at the bottom of the unit. The volume removed is sufficient to lower the level of the catalyst bed to a point below the second test cock. Fresh catalyst is then charged into the top of the unit in such quantity that when the bed is again expanded, the catalyst level is at about the second test cock.

The frequency of catalyst withdrawal and replacement and the quantity removed each time depend upon a number of factors, such as the flow rate, number of hours in operation, amount of hardness being removed, and size of plant. The enlarged catalyst may be discharged onto a heap for draining or into drain carts that slide under the unit so that this material can be readily removed for disposal in trucks, freight cars, or the like.

Operating Results

The quantities of chemicals required for producing a given result are of the same order as with the sludge-contact type of precipitator—i.e. only small excesses are required above the theoretical quantities. The particular chemicals to be used depend upon the substances to be removed. If it is only desired to remove calcium bicarbonate [$Ca(HCO_3)_2$], lime alone is used. If in addition, it is desired to remove Ca^{++} in excess of the HCO_3^- present, it is necessary to add soda ash (Na_2CO_3) to furnish the necessary CO_3^{--} for precipitation. In either case, the resultant $CaCO_3$ adheres very effectively to the catalyst granules. Thus in the 5 to 10 minutes' contact time in the Spiractor unit, the bulk of the precipitated $CaCO_3$ is taken up and held firmly by the catalyst granules, and the small amount of residual turbidity is removed in the subsequent passage of the water through filters containing sand or other suitable filtering medium.

Where it is desired also to remove some of the magnesium present, it is necessary to feed (in addition to the $Ca(OH)_2$ for precipitating the Mg^{++}) some suitable coagulant such as alum or ferric sulphate. Experience indicates that the $Mg(OH)_2$ is not as adherent as the $CaCO_3$ precipitate, and the addition of the coagulant overcomes this difficulty to some extent. However, even with the coagulant, the $Mg(OH)_2$ does not adhere quite as effectively as the $CaCO_3$, and the result is a somewhat higher turbidity in the effluent of the unit before it enters the filters. However, precipitation is complete as indicated by the fact that the filtered effluent is clear and remains clear upon standing, whether or not Mg^{++} is being removed in addition to Ca^{++}. But in view of these facts the use of the Spiractor at the present time is limited to cases where the Mg hardness to be removed does not exceed 50 to 75 p.p.m., expressed as $CaCO_3$.

Actual performance data on some recent installations confirm the long-term tests and experiences. One installation treats the water supply of a village in Illinois. The capacity is 70 g.p.m. and the installation is shown in Fig. 4. The Spiractor unit (which is 4

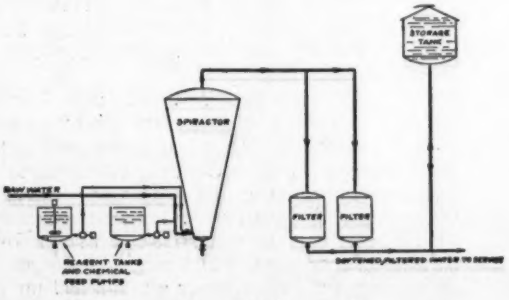

FIG. 3
Flow Diagram of Typical Spiractor Installation

FIG. 4
Municipal Spiractor Installation in Illinois

TABLE II
(All results expressed in p.p.m.)

	Raw well water	Final effluent after lime-alum treatment and passage through Spiractor and filters (a)	(b)*
Total hardness ..... as $CaCO_3$	271	76	60
Calcium hardness ..... as $CaCO_3$	165	12	12
Magnesium hardness ... as $CaCO_3$	106	64	48
Methyl orange alkalinity as $CaCO_3$	382	184	176
Phenolphthalein ..... as $CaCO_3$	0	92	96
Free CO_2 ..... as CO_2	10	0	0
Iron ..... as Fe	0.3	0.1	0.1
Turbidity	5	0	0

* This represents results obtained with causticity of 16 p.p.m.; however the plant normally operates without appreciable causticity and with the results shown in (a).

feet 6 inches top diameter by 11 feet high) and the chemical tank appear in the foreground. The two sand filters, each 54 inches in diameter by 5 feet high appear in the background. In this instance, it was only desired to reduce the total hardness to a figure below 100 p.p.m., and Table II shows that to obtain these results it also is necessary to remove some Mg^{++}.

A great number of stability tests have been made on the final treated water by allowing it to stand in closed bottles for periods of 24 and 48 hours. Analyses subsequent to such standing have indicated that there is practically no further decrease in hardness or alkalinity or increase in turbidity on such extended standing, which gives evidence of the high stability of this treated effluent. Conventional marble tests also indicated that the treated effluent is stable.

Another installation is shown in Fig. 5. Here the chemical feed and unit appear at the left, and the filters at the right in the photograph. In this case, the capacity is 100 g.p.m., and the Spiractor is 5 feet top diameter by 11 feet high. The two Anthrafilt filters are each 72 inches in diameter by 5 feet high and it will be noted that in this case, as well as in the municipal installation, there is a single multiport valve control for both filter units. The data in Table III indicate that here again it is only desired to reduce the hardness partially, so that the chemical dosage was limited. Also it will be noted that some Mg^{++} is removed.

Stability tests on this final effluent also indicate that it is clear and remains clear upon standing and

TABLE III
(All results expressed in p.p.m.)

		Raw well water	Final effluent after treatment by lime-ferric sulphate and passage through Spiractor and filters (a)	(b)*
Total hardness	as $CaCO_3$	320	72	54
Calcium hardness	as $CaCO_3$	175	10	10
Magnesium hardness	as $CaCO_3$	145	62	44
Methyl orange alkalinity	as $CaCO_3$	330	70	48
Phenolphthalein alkalinity	as $CaCO_3$	0	36	32
Free CO_2	as CO_2	15	0	0
Iron	as Fe	0.4	0.1	0.1
Turbidity	.....	5	0	0

* This represents results obtained with causticity of 16 p.p.m.; however the plant normally operates without appreciable causticity and with the results shown in (a).

FIG. 5
Spiractor Installation in an Indiana Hospital

that there is no further reduction of hardness or alkalinity after such standing periods.

A considerably larger installation is being constructed for a large middle western woolen mill. This installation will have a capacity of 1000 g.p.m. and the Spiractor will be 11 feet top diameter by 25 feet high.

Raw well water of the following composition is to be treated with lime, soda and alum:

Total hardness	as $CaCO_3$	354
Calcium hardness	as $CaCO_3$	238
Magnesium hardness	as $CaCO_3$	116
Methyl orange alkalinity	as $CaCO_3$	268
Free CO_2	as CO_2	8
Iron	as Fe	3.0
Turbidity	.....	0

Another large installation is now being fabricated for one of the U. S. Marine barracks on the Atlantic seaboard. This installation is to have a capacity of 3,000,000 g.p.d. and includes three units, each 10 feet 6 inches top diameter by 22 feet high. In this instance the composition of the raw well water is as follows:

Total hardness	as $CaCO_3$	180
Calcium hardness	as $CaCO_3$	172
Magnesium hardness	as $CaCO_3$	8
Methyl orange alkalinity	as $CaCO_3$	194
Free CO_2	as CO_2	25
Iron	as Fe	2

It is desired to produce an effluent having less than 68 p.p.m. total hardness; therefore it is only necessary to precipitate $Ca(HCO_3)_2$ by treatment with lime alone.

Fields of Application

In considering the fields of application for which the Spiractor is particularly suited, it is well to review the specific advantages and limitations of this process:

(a) *Types of Water.* Especially suitable for removing calcium salts. Not recommended for high Mg^{++} removal nor for removal of substantial amounts of turbidity and color as are present in many surface water supplies. Thus the process is mainly limited to the treatment of clear filtered water or clear well waters that are predominantly high in calcium hardness.

(b) *Extent of Treatment.* Table I shows that the lower limit of effluent hardness is 50 to 70 p.p.m. If it is desired to remove the residual hardness from a portion or all of the treated water supply, this can be readily accomplished by zeolite post-treatment.

(c) *Space and Re-pumping.* The volume of the Spiractor unit corresponds to a 5 to 10-minute detention period in place of about 1 hour, which is the shortest detention period with other types of cold lime-soda treatment—even the sludge-contact-type precipitators. Thus there is a substantial saving in steel and space, both of which may be very important, especially at this time. Use of the pressure type which eliminates re-pumping further simplifies the installation.

(d) *Granular Waste Product.* The waste catalyst contains less than 5% moisture, and, when allowed to drain in the open air, this drops even further, so that the final waste material can be handled as easily as an ordinary damp sand. In some cases this waste product can even be sold in the vicinity for industrial or agricultural purposes. Where the Spiractor is being used for calcium removal only, the final granules are pure

$CaCO_3$. Thus large lime consumers will find this waste product suitable for charging as a raw material into the lime kilns, where it can be readily calcined to CaO.

(e) *No Moving Parts.* It also should be noted that the equipment does not contain any moving parts since all the agitation required for the process is accomplished by the upward spiral flow of the water through the catalyst bed. Also this makes it practical, by properly designing the chemical feeds, to use this system where electric current is not available.

It follows that the fields of application for which the Spiractor is particularly suited include:

(a) *Paper Industry.* Where calcium bicarbonate hardness forms objectionable scale and deposits in bleaching tanks, and on screens, deckers, recirculating equipment, pumps, condensers, cooling jackets, etc. In such cases large volumes of water are frequently required and the high efficiency of the Spiractor in removing calcium bicarbonate at minimum cost in a minimum size plant and without sludge disposal difficulty, is particularly desirable. Furthermore, the solid granular $CaCO_3$ waste product of low moisture content is especially suitable for calcining to produce quicklime that is needed in the causticizing process.

(b) *Municipal.* Especially where the bulk of the hardness to be removed is calcium hardness and where the raw water is clear, and particularly in those cases where it is desired to avoid the problem of watery sludge disposal.

(c) *Cooling Water Treatment.* Where it is desired to provide a stable water that will not form $CaCO_3$ deposits in the cooling systems and especially where some of the cooling water, after it picks up heat, is to be further treated for boiler feed purposes or other process work. In such instances, the alkalinity reduction due to lime pretreatment is advantageous.

(d) *Railroad Locomotives.* For reducing the amount of sludge in boilers and adding the excess alkalinity that it is desired to maintain in such boilers. The Spiractor in such cases can quickly earn its first cost by the large savings due to the use of chemicals available in the open market instead of the use of proprietary compounds. At the same time, most of the sludge that was present in the boilers will have been transferred to the catalyst granules as accretions. Also the possibility of operating without electric current is frequently attractive to such isolated stations that have no electric power available.

The actual large-scale experiences with the Spiractor substantiate the satisfactory results obtained in long term tests and it may be anticipated that this process will fill a substantial need in the ever-expanding field of water treatment.

First All Buna S Conveyor Belt Produced At Hewitt Plant

The Hewitt Rubber Corporation has completed the manufacture of an all-synthetic rubber conveyer belt which is believed to be the first of its kind made from Buna S synthetic rubber, without the addition of natural rubber or reclaimed rubber.

Buna S is made by a chemical combination of butadiene and styrene, and is the general purpose rubber for which our Government is building plants to produce 700,000 tons per year.

Hewitt was an early pioneer in the production of synthetic rubber products for the basic industries of the nation, ever since the introduction of the oil-resisting type of synthetic rubber in the United States in 1931.

Michael Berman, manager of research and development, stated, "Hewitt is one of the large users of man-made or synthetic oil-resisting rubber such as Neoprene, Perbunan, HyCar, and Thiokol. Among the many synthetic rubber products, which are so vital to our armed forces for the prosecution of the war, developed in the Hewitt Laboratories, are Smooth Bore Oil Suction and Discharge Hose for the refueling of warships, bullet-sealing gasoline tanks for aeroplanes; and synthetic rubber gasoline hose for the refueling of Army and Navy aircraft."

Buna S, which is a non-oil-resistant synthetic rubber, will gradually replace natural rubber, as the Government plants swing into mass production in 1943, in the major lines of Hewitt products for war industries, such as conveyer and elevator belting, transmission belting, pneumatic tool and welding hose, fire hose, railroad hose, acid and chemical hose, and many miscellaneous molded articles.

Chemical Engineering

To its well known Chemical Engineering Series of textbooks the McGraw-Hill Book Company has recently added Chemical Engineering and Production Supervision by David E. Pierce, chemical engineer, Rohm and Haas Company, Philadelphia, Pa. (232 pages, 56 illustrations).

This book has been written particularly to aid the nontechnical operating man in dealing with his day to day production problems. To utilize the book no previous training in chemical engineering is required.

The five major unit operations of chemical engineering (heat transfer, evaporation, distillation, drying and flow of fluids) are arranged to show their fundamental principles without the theoretical proof of formulas or discussion of the numerous variables involved in detail of design. The illustrative examples are worked out in great detail so that each step in the calculation is clear. All charts necessary for the working of problems are provided.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd street, New York, N. Y., for $2.50 per copy.

OPA Issues Amendment on Old Rags

WASHINGTON, D. C., September 23, 1942—Monthly reports are no longer required of suppliers, dealers and purchasers who sold or bought 10 tons of old rags in any one month, the OPA has announced in issuing Amendment No. 3 to Revised Price Schedule No. 47 (Old Rags).

This action revokes the amendment to the schedule issued in February which required all persons who sold, bought or engaged in the brokerage of old rags to keep certain records of their transactions and file reports, showing tonnage of old rags delivered, consumed and on inventory, if they made sales of or bought more than 10 tons in any one month after December, 1941.

Microbiological Deposits and Bacteriological Corrosion

By A. E. Griffin[1]

Abstract

Studies of the life habits and economic significance of biological growths in water systems began early in the nineteenth century. Early in the twentieth century it was learned that most of the so-called iron organisms also utilized manganese in their metabolism. It is now recognized that Gallionella and Spirophyllum are the only bacteria of the iron group using iron bicarbonate to the exclusion of manganese bicarbonate. Where slimes accumulate, corrosion is almost sure to follow. Corrosion is an indirect result of biofouling. Biofouling creates the proper environment for increased activity of the species of bacteria responsible for the formation of hydrogen sulphide, carbon dioxide, and organic acids all of which accelerate corrosion.

Hydrogen sulphide may come from sulphur in the protein or from sulphates in the water. Biofouling may be eliminated by controlled chlorination. In addition to controlling bacterial growth, chlorination will bleach color, aid coagulation and oxidize iron and manganese to insoluble forms. Chlorination will keep filters at maximum capacity by preventing the growth of slime and iron manganese bacteria. Proper treatment, combined with controlled chlorination of process water will prolong pipe life, maintain capacity and insure the delivery of a pure finished product.

Introduction

Since the turn of the century, the use of chlorination has been standard practice for the destruction of pathogenic microorganisms in domestic and public drinking water supplies. Acceptance was due to its disinfecting efficiency *(1)* over other known germicides, and to the development of highly efficient apparatus for the accurate control of the commercially available liquid chlorine. Its use was quickly extended to include sewage treatment, swimming pool sterilization, and, during the late twenties, for the control of slime growths in industrial water supplies and distribution systems. Other chlorination practices include iron and manganese removal, color removal, hydrogen sulphide elimination, coagulation improvement, and algae control.

It was early realized that organic accumulations *(2)* were connected with pipeline failure and pipeline closures, as evidenced by writings beginning with that of Ehrenberg *(3)* in 1836. These investigations and reports continually referred to iron and manganese-depositing bacteria, and to the importance of sulphur bacteria. Some writers spoke of such accumulations as "water diseases," and to the causative organisms as "well pests".

Biofouling

These frequent references to pipeline difficulties indicate that the whole collection of organisms familiar to early workers, plus those recently recognized, is present in the large modern industrial plant, service water supply, processing units, papermaking machines, heat-exchangers, steam condensers, and waste disposal works. These organisms include bacteria, fungi, algae, etc., combining to agglomerate organic and inorganic matter as deposits of slime, or biofouling in water circuits. The variety of the fungi alone is legion, and few have been studied for exact identification.

Modern methods of water purification have brought tremendous reductions in the bacterial flora of the finished water. Actually, improvements have been so satisfactory that frequently the numbers of organisms left for seeding have been ignored, with the result that many distribution systems and transmission mains are now showing signs of corrosion, or are gradually becoming clogged with tubercles and organic growths. This was emphasized by Reddick and Linderman *(4)*, who pointed out that much cast iron pipe corrosion is the result of biological activity, and by Ackerman *(5)* who demonstrated that the loss in carrying capacity of the Hinkley line was due to accumulations of organic material of biological origin.

In spite of these indications, it is only during the past few years that the role of bacteria has been given detailed and systematic study. About 1924, it was concluded by Kuhr *(6)* that severe corrosion of steel pipelines in the wet, high organic, lowland soils of the Netherlands had been due, in large part, to the action of certain types of anaerobic bacteria belonging to the general classification "desulphuricans". In 1941 it was reported by Thomas *(7)* that several pipeline failures had been traced to the activity of these same organisms. Bunker *(8, 9)* and Hadley *(10, 11)* have recently indicated that much external corrosion of steel and cast iron is of bacterial origin. That pipeline deterioration of this type is not a local phenomenon is evidenced by Bunker's observations, which were largely made in England, while Hadley drew his conclusions from oil pipeline experiences in the U. S. A.

Most water-circuit deposits consist of mucilaginous mixtures of capsulated bacteria, various forms of iron and manganese bacteria, together with higher forms of microorganisms which may abound in the water itself. These masses will absorb and entrain organic and inorganic matter from the passing water. As these deposits grow, following life and death of the living material, oxygen becomes depleted at the core, thereby making ideal conditions for the growth of species of bacteria capable of releasing hydrogen sulphide, carbon dioxide, or organic acids as end-products, all of which provide the necessary conditions for corrosion. That hydrogen sulphide is produced is quite evident from the sulphurous odor given off when the tubercles are opened, together with frequent deposits of ferrous sulphide. Regarding the corrosion itself, it has not been determined whether electrochemical corrosion results in favorable environmental conditions in which organisms develop and

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corrosion is accelerated, or whether end products of growth accumulate first, and are thus an initial cause.

Hydrogen Sulphide

Of the compounds mentioned above, hydrogen sulphide is perhaps the most difficult to account for, because chemical conditions in water circuits are usually unfavorable for its formation by purely chemical reactions. Carbon dioxide is a well known byproduct of bacterial activity, as are certain organic acids, but to obtain hydrogen sulphide some form of sulphur must be present. In water circuits such compounds could be present as sulphates in the water itself, or in the cells of the slime and iron-manganese bacteria making up the organic deposits on the interior of the pipe. It is generally considered that the bulk of the sulphides found in tubercles and biofouling accumulations originates from the latter source. This is a very logical explanation, for practically all bacterial cells contain a considerable percentage of proteins, most of which contain about 1% sulphur. From this source large quantities of sulphide are produced by anaerobic breakdown of these compounds by any one of many bacterial species, ranging from spore-forming anaerobes to the common E. coli. Naturally, the amount of sulphide produced depends upon the sulphur content of the particular protein under attack, and the completeness of the anaerobic condition. This is important when considering the source of odors in the finished product.

Should the water where the biofouling occurs contain large amounts of sulphates, considerable quantities of hydrogen sulphide could be produced in the tubercles by the activities of a highly specialized species known as Spirillum desulphuricans. This organism utilizes the oxygen from sulphates to oxidize carbon compounds in order to secure an energy balance for itself, giving off hydrogen sulphide and oxygen as a byproduct. This organism seems to grow best at temperatures above 45 deg. C., but it will also develop, although at a slower rate, at lower temperatures. In addition to sulphates, it will also reduce any other oxidized form of sulphur and also sulphur itself. Under some circumstances it may not, in one step, reduce the compounds all the way to hydrogen sulphide, but rather precipitate out the sulphur which may then be reduced further. The differences between this process and that carried out by the iron bacteria are evident. The iron and manganese bacteria oxidize ferrous or manganous salts with molecular oxygen to obtain energy necessary for their life. Spirillum desulphuricans are anaerobic — i. e., the presence of molecular oxygen is injurious to them— consequently they obtain their energy by oxidizing carbon compounds with oxygen, obtained by reducing the oxidized forms of sulphur.

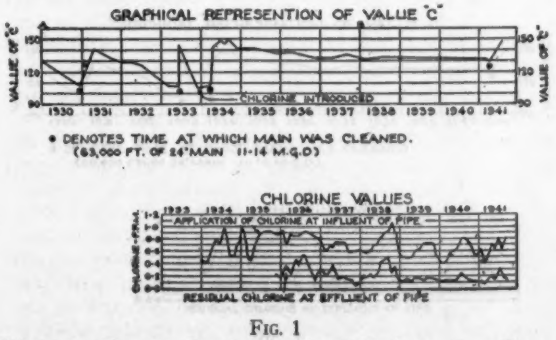

GRAPHICAL REPRESENTION OF VALUE "C"
VALUE OF "C"
150
120
90
CHLORINE INTRODUCED
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
• DENOTES TIME AT WHICH MAIN WAS CLEANED.
(63,000 FT. OF 24" MAIN 11-14 M.G.D.)
CHLORINE VALUES
APPLICATION OF CHLORINE AT INFLUENT OF PIPE
RESIDUAL CHLORINE AT EFFLUENT OF PIPE

FIG. 1

Chlorination Maintains Carrying Capacity of Pipelines. From Data Presented by J. Walker Ackerman, Utica, N. Y. A-B from *Water Works & Sewerage*, P. 424, (April, 1938)

Capsulated Bacteria

The capsulated bacteria in these mucilaginous mixtures, so intimately associated with corrosion, foul odors, and reduced pipeline capacity, are identical with those found in the paper mill itself. Usually, all known species are present with one type predominating over the other, depending upon the environmental factors. The iron bacteria in the slimes may consist of Crenothrix, Cladothrix, Clonothrix, Leptothrix, Gallionella, or Spirophyllum mixtures, or any combination thereof. All are thread-like in character, thereby making good "mat" material when growing in quantity. All attack the bicarbonate salt of iron, leaving the iron as a waste product. At first it was thought they attacked iron alone, but early in this century it was shown that the first four actually seem to favor manganese and in its presence some appear to grow larger than in the presence of iron alone *(12)*. It was this peculiarity, first noticed by Jackson, which led him to apply the name of Crenothrix Manganifera Jacksonii to the Crenothrix-like organism growing in the presence of manganese. Since that time it has become accepted practice to use the term Crenothrix when speaking of this type of organism where iron is present, and the term Crenothrix Manganifera when manganese is present. In addition to Crenothrix, Leptothrix also seems to show a preference for manganese. Gallionella and Spirophyllum are the only species known to be exclusive attackers of iron bicarbonate. Where any one, or all, of these species abound, biofouling difficulties become all the more troublesome, due to the deposits of iron and manganese, which may reach considerable proportions.

Reduction in Pipeline Capacity

Waterworks literature is replete with cases from New York to San Francisco, wherein water systems handling "pure mountain water", or treated water of excellent character are fouled by accumulated microbiological deposits.

At Utica, N. Y., for instance, a 24-inch cast iron main, twelve miles long, laid in 1906, was in continuous service until 1922, when the value of *C* in Hazen-Williams formula had fallen to 90, from 109 in 1917, and from 95 in 1921. The main was cleaned in 1922. However, fouling occurred so rapidly that eight cleanings were necessary to meet the consumption demands between 1922 and 1934. To meet this situation, and to avoid either the construction of a new pipeline or the installation of new pumping equipment, or both, a systematic research program was inaugurated to determine the cause of these periodic drops in capacity, and to suggest a possible remedy. This resulted in the conclusion that slime growths were the cause, and that these growths could be eliminated by the maintenance of a residual throughout the entire pipeline. The accuracy of this diagnosis and cure was evidenced by the fact that, following the application of ammonia and chlorine at the inlet, the value of *C* has remained very close to 130 whenever the chlorine residual has been maintained above 0.1 p.p.m. When it drops below 0.1 p.p.m. there has been a tendency for the *C* value to drop. This treatment has controlled the growths to such an extent that but one cleaning has been necessary since 1934. The success of this treatment is shown in Fig. 1.

At Little Rock, Arkansas *(13)*, a 39" internal diameter concrete main, thirty miles long, laid in 1938, dropped off in capacity within a year from 25.32 m.g.d. to 20.38 m.g.d. An examination of the interior revealed a lush growth of bacteria, etc., up to ¼" thick, attached to the inside surface. Microscopical analyses showed this slime to be largely composed of iron bacteria and typical slime-formers (Figs. 2, 3, 4). These are the same organisms so frequently found in paper white water systems. To overcome this, chlorine and ammonia were applied at a ratio of about 3:1 to the main about 1500 feet below the intake. Using about 1.26 p.p.m. chlorine resulted in a residual of 0.55 p.p.m. at the filter plant. Three weeks from the start of this treatment the capacity of the line increased from a low of 20.3 to 21.8 m.g.d. At the end of a year, April, 1940, a test of the line showed a capacity of 22.25 m.g.d., an increase of nearly 10%.

When first one western water supply was brought through long tunnels to supply reservoirs, the carrying capacity of an observed line decreased from 16 to 13.6 m.g.d. in a period of a few weeks. On inspection it was found to contain slimy, gelatinous growths, along with iron bacteria. After the conduit was drained, the collapsed growths on the walls ranged in thickness from ⅛ to ¼". These growths were the result of seeding through infiltration of iron bacteria through small cracks in the tunnel walls. For the past several years multiple chlorination of the tunnel system has controlled these slime and iron deposits.

These examples from the waterworks field have been given due to the large amount of comparative data available in that line of endeavor. Similar, and full as spectacular instances have resulted in the industrial field over and over again. Take, for instance, the industrial line serving three large plants near Perth Amboy, New Jersey, where the water entering the conduit was clear and sparkling, yet was dull and cloudy upon arrival at the individual treatment plants where the iron was removed. In the beginning the service line was ample in size for all needs, but with the passage of time the volume of water grew less and less. An examination into the cause revealed the interior of the pipe to be covered with a thick felt, consisting of a nearly pure culture of Spirophyllum, the organism which is a true "iron bacteria" in the strictest sense of the term, inasmuch as it cannot use manganese and its growth is depressed by the presence of soluble organic matter. Chlorination was immediately applied for correction.

River waters, as well as well waters, also are troublesome, and particularly where industrial pollution is present. The Monongahela River in the vicinity of Pittsburgh, Pennsylvania, is typical. Up until a few years ago the water in this stream had always been very acid in nature. Now, however, since the institution of the mine sealing program, and since the completion of the Tygarts Valley Dam at Grafton, West Virginia, the water has lost most of its acidic nature and is becoming more alkaline.

Prior to this change the few plants using the water for cooling purposes were obliged to treat it with lime to prevent corrosion, and due to this acid nature of the water very few slime difficulties were encountered. However, following the change from acid to alkaline conditions, slime difficulties increased to the point where corrective measures became imperative. One of the first to take this step was a small power plant belonging to the Pittsburgh and Lake Erie R. R., located at Pittsburgh.

This changed river condition also caused trouble at the Eliza Works of Jones & Laughlin, in the form of slime accumulations on the surface condensers to such an extent that cleanings every three or four days became necessary, *(14)*. With the installation of temporary chlorinating equipment in the spring of 1941, set to apply chlorine for one hour out of each eight, control of condensers was regained, thereby cutting down the cleanings to one every other month.

With the approach of warm weather last year, the microorganisms grew so rapidly in an air conditioning unit of this plant that its capacity was seriously impaired. This situation was again remedied by chlorinating all water going to the unit. By the time the air conditioning water supply had been brought under control, it became necessary to treat the water going to the turboblowers, and so it went throughout the mill. In the end, each test was so successful that preparations are now being made to chlorinate all the cooling water coming from the Eliza furnace pump, which amounts of approximately 180 m.g.d.

In all industrial work it must be recognized that

FIG. 2 FIG. 3 FIG. 4

safe and acceptable domestic waters may not always be sterile waters. The chlorination of such waters is usually limited to destruction of, or insuring against, the presence of pathogens. Thus, except in specialized cases wherein nonpathogenic fungus forms, or wherein resistant bacteria may result in taste production, main fouling or filter clogging, the average domestic supply is seldom sterilized to the point where no microorganisms are left in the finished product.

This is exemplified by the experiences of a butter manufacturer in a midwestern town. This manufacturer obtained all water from the town supply which conformed to recognized standards of bacteriological quality. When, however, the water was used for butter manufacture a slightly rancid taste developed in the finished product upon standing. Investigation into the reasons thereof showed that the water, while perfectly safe for drinking, contained an organism which grew at an accelerated rate in the butter, resulting in a taste of rancidity. Chlorination proved to be an economical way to overcome this condition.

Lake Providence, Louisiana, obtains its water from a series of wells which empty into a storage tank, from which the water is pumped to town. From a safety viewpoint the water can be used without treatment for all types of domestic use. It so happens, however, that it contains the seed of a certain type of fungus which grows very rapidly after the water leaves the ground. A few years ago this growth, although in no way impairing the safety of the water, had reached such a stage that the entire distribution system was becoming clogged. In addition, the taste and odor of the water increased. This condition was eliminated by chlorinating to the breakpoint. When first started, the tastes and odors were worse than ever, particularly when large sheets of the biofouling material became detached and showed up in the residence taps. Now, however, the water has again become free of taste, and the mains have again become adequate in capacity to meet all needs without the use of excessive pressures.

The water supplied to most large cities in the country is usually considered of excellent quality, both from a bacterial and chemical viewpoint. However, in the early days of the gas refrigerator when water was used for cooling, considerable difficulty was experienced with the clogging of water lines and valves. An investigation into the cause showed the small ports and drain pipes to be completely clogged with slime growths. This was overcome by raising the feed rate of chlorine sufficiently to insure the maintenance of a residual throughout the system. Once this was done the slimes disappeared and the difficulty was eliminated.

A few years ago steel transmission mains were laid from the well field to the distribution system of a city in Ohio. According to all bacteriological standards the water was perfectly safe for all domestic purposes, and according to chemical standards it was non-corrosive, or non-aggressive as some people prefer to call it. In spite of this, within three years after installation numerous leaks appeared which proved to be due to corrosion, as a result of bacteriological activity and biofouling. Chlorination of the water at the source removed these organic accumulations, thereby arresting the rate of corrosion.

Iron and manganese bacteria in distribution systems can be particularly troublesome. Ordinarily an iron content of 0.3 p.p.m. is of little consequence in a water supply. On occasion, however, a few iron bacteria can work on small amounts, withdraw it from solution, and deposit it in concentrated areas and particularly in "dead ends." In southern California difficulties of this sort are avoided by what is known as superchlorination and dechlorination *(15)*. In Minnesota, the favored treatment consists of the addition of chlorine and ammonia. In Stillwater, Minnesota, iron bacteria grew so prolifically that at one time the water was almost unusable, and this in spite of the fact that the water as it came from the well contained but 0.3 p.p.m. iron. Following the application of chlorine and ammonia the red deposits disappeared with the appearance of residuals.

Bacterial activity is not confined to the interior of pipes leading to mills, or to the distribution systems within them. Frequently these selfsame organisms are at work below the surface of the ground producing hydrogen sulphide, which sometimes appears in the water, notably along the coast line of the country, *(7)*, or in our natural underground fuels such as petroleum, natural gas, and coal. When waters of this type are used in paper manufacture they must be treated with chlorine, or otherwise, before a suitable product can be obtained. For instance, there was developed in Florida a few years ago an 8 m.g.d. water supply for a paper mill under construction there. The supply consisted of two series of wells, one coming from a strata containing hydrogen sulphide, the other containing iron in true solution. Both sets of wells deliver into a common header which leads to the mill. Upon its arrival there, the water had the appearance of thin ink, thereby making it unfit for manufacturing purposes due to the dullness and off-color imparted to the paper. This was remedied by the application of chlorine, which reacted with the iron compounds in such a way that the color of the paper was not affected.

At another plant 30 m.g.d. *(16)* are being treated with chlorine to remove the hydrogen sulphide before it has a chance to react with any iron present, or otherwise cause harm.

Disinfecting Treatment

Color removal usually entails coagulation and filtration which, at best, is a somewhat costly process both in capital outlay and daily operation, and particularly where quantities of water reaching into millions of gallons daily are involved, as in the paper industry. Any methods involving savings in this respect are highly desirable. In the domestic field it is usual to reduce the color to at least fifteen, or below. In the manufacture of paper, considerably higher color may be used, although many high grade papers require water whose color must not be above ten, and sometimes must approach zero. Partial decolorization, on the other hand, will usually meet all needs so that modified and simplified procedures may be used. In many instances satisfactory bleaching can be obtained by simple chlorination, a process which, in addition, will sterilize the water and aid in the control of slime accumulation within the mill itself.

In plant practice it has been found that the reductions in color vary almost directly with the amount of chlorine applied until the breakpoint is reached. Beyond this point little more color is extracted. Figure 5 is typical of most waters whose color yields to chlorine. In this particular instance the reduction amounted to about 37%, in others it may amount to

as much as 75%. A few waters may fail to respond to such treatment so that laboratory experiments should always be run prior to placing the process in operation.

Where coagulation must be used, the efficiency of the process depends, to a large extent, upon the ability of the coagulant to form a satisfactory floc. Excellent results are usually the rule, but there are occasions where the floc may be reluctant to form, and others where but indifferent results are obtained. In such cases, cholrine has often been found very helpful. Here, again, best results are obtained by chlorinating to the breakpoint, or beyond. Chlorination short of the breakpoint does not fully condition the water. This is shown in Fig. 6. In this case the indicated amounts of alum alone were added to a series of raw water samples. To another, 8 p.p.m. chlorine, the amount required to reach the breakpoint, was first added followed by the same amounts of alum as were added to the first series. The difference in the two series was as apparent in the character of the floc formed as are the numerical differences in the resulting colors. Expressed in percentages, the combination of 8 p.p.m. chlorine and 2 g.p.g. alum removed 81% of the color as compared to about 50% with alum alone. On the other hand, 8 p.p.m. chlorine and 2.5 g.p.g. alum removed approximately as much color as did 4 g.p.g. alum alone. The savings in cost would amount to sums from $1.00 to $2.00 per million gallons, depending upon the current cost of chemicals.

Both iron and manganese are widely distributed in the water supplies of the United States and Canada. Iron is relatively easy to remove from solution, usually requiring, when present as a bicarbonate, little more than aeration followed by settling, with or without lime, and final filtration. In some instances, particularly where the water must be treated under pressure, chlorine may be substituted for air. Likewise, chlorine may often be substituted for lime, particularly where the water is filtered by gravity.

Organic iron, or organic iron complexes, in contrast to inorganic forms, requires special methods for removal, usually involving coagulation, either with alum or one of the iron salts. Occasionally, pretreatment with chlorine is necessary.

In all cases where sand is used for filtration, the efficiency of the sand increases with age. For instance, dissolved iron may pass through new sand without change, yet after aging this same sand will reduce the iron content from 1.0 to 0.01± p.p.m. without other treatment.

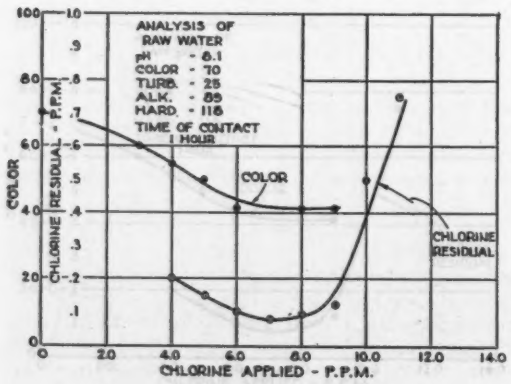


FIG. 5
Color Reduction with Chlorine. Case "A"

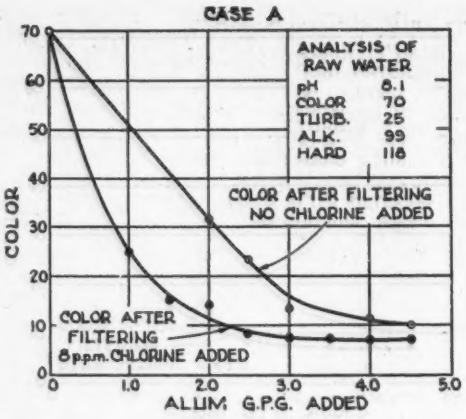


FIG. 6
Effect of Chlorine on Alum Coagulation and Color Removal. Case "A"

Efficient as sand filtration usually is for iron removal, frequently very short filter runs are obtained due to the accumulation of slimes on the surface of the sand. These slimes are usually made up of mats of iron bacteria, interspersed with various algae, which under favorable conditions accumulate very fast and become so thick that the water cannot get through. This has been overcome by adding chlorine ahead of the filters. The iron removal plant at Urbana, Illinois, is a typical example. At that plant, where iron is removed by aeration and filtration, it has been repeatedlv proven that the plant cannot be operated without the addition of chlorine ahead of the filters.

Manganese is much more common in water supplies than generally believed. For instance, less than ten years ago, following the discovery of large deposits in a long transmission main in a midwestern city, it was at first concluded that these deposits must have come from the pipes themselves, in view of the then prevailing opinion that very few waters contain more than a few hundredths p.p.m. manganese. Later on, however, it was found that the water in the wells contained from 0.5 to 2.0 p.p.m. of this mineral. With the deposition of a small amount of this as manganese dioxide, further deposition was accelerated by catalytic action until the accumulation became of sufficient magnitude to cut down the capacity of the pipes. Following this discovery a manganese removal plant was erected, consisting of chlorination, aeration, contact beds, settling and sand filtration. Chlorination at first was not considered essential to the process, yet experimental runs, backed by years of experience, have proven that without chlorine poor efficiencies are obtained. At a pilot plant of 10 g.p.m. capacity, which reduced the iron from 6.0 p.p.m. to less than 0.5 p.p.m., no manganese removal was accomplished until sufficient chlorine was applied to maintain a "breakpoint" residual throughout the system.

In the industrial field, no less than in the domestic field, iron and manganese bearing waters, together with slime growths, are a nuisance and at times a distinct liability as exemplified by the experiences of a large southern industry *(17)* using water from a nearby reservoir. When first completed the water from the reservoir, following filtration, was of excellent character. However, late in the summer of the first year, excessive amounts of manganese appeared at the intake. This was quite a surprise, particularly

since early analyses had shown very little evidence of this metal. The problem was solved by partially draining the lake through the blow-off system. In this way the manganese content of the bottom water was greatly reduced. The sudden appearance of manganese was attributed to the leaching effect of the water on the inundated organic matter in the soil, accumulated leaves, grass, unremoved stumps, etc.

In addition to iron and manganese trouble this same mill has experienced difficulty with short filter runs. Investigations into the cause of this showed the sand to be clogged with huge quantities of slime. Several methods of control were considered including sand washing with caustic soda and treatment of the raw water with chlorine and ammonia, procedures which were finally adopted. While this treatment gave some relief the problem was not entirely overcome as indicated by the continuation of extensive biofouling in the distribution system. This situation, however, is being taken care of by gradually increasing the application of chlorine to the point where effective chlorine residuals carry through the filters and into the water systems.

Literature Cited

1. Estes, N. C. *Ref. & Met. Gas Mfrs. J.*, 17: 5 (1938).
2. O'Connell, W. J., Jr. Proceedings 11th Mid Year Meeting Amer. Petroleum Institute, May 21, 1941, Sec. no. 3, Div. of Refining, vol. 22M, 1941.
3. Ehrenberg, C. G. *Poggendorfs Ann.* 38, 213-27 (1936).
4. Reddick, H. G. & Linderman, S. E. *J. N.E.W.W.A.* 46 (2) 146-69 (1932).
5. Ackerman, J. W. *Water Works & Sewerage* 85 (4) 424 (1938).
6. Kuhr, C. A. H. von Wolzogen. *Wasser U Gas* VII (26) 277 (1923).
7. Thomas, Arba. *Western Pa. Eng. Soc.* Nov. 1941.
8. Bunker, H. J. *Proc. Brit. Assoc. Refrig.* 33 (1) 151 (1936-7).
9. Bunker, H. J. *J. Soc. Chem. Ind.* 58 (3) 93-100 (1939).
10. Hadley, F. H. *The Petroleum Engr.* March and April 1940.
11. Hadley, F. H. *The Oil & Gas J.* Sept. 21, 1939.
12. Zapffe, Carl. *J. A.W.W.A.* 25 (5) 625-676 (1933).
13. Crist, Marion R. Chloramine Committee Report *J. A.W.W.A.* 33 (12) 2103-2107 (1941).
14. Johnson, E. P. & Griffin, A. E. Eastern States Blast Furnaces & Cork Oven Assn. Feb. 1942.
15. Alexander, L. J. *J. A.W.W.A.* 32 (7) 1137-1146 (1940).
16. Staff Report. *Chem. Met. Engr.* (June, 1941).
17. Frisk, P. W. *J. A.W.W.A.* 24 (3) 425 (1932).

F. P. Doane Goes to Sandy Hill Works

The Sandy Hill Iron and Brass Works, Hudson Falls, N. Y., announced last week that Foster P. Doane, Jr., widely known in engineering and paper making circles, has joined its organization. Bringing to Sandy Hill experience gained in a lifetime of practcal engineering, and 12 years in production problems in paper making, Mr. Doane fits ideally into the set-up of the Hudson Falls organization, where key men are able to point to substantial backgrounds in both paper mill and engineering activities.

Mr. Doane has been general superintendent of the Fort Edward mill of the International Paper Company, where he had general charge of production as well as engineering.

With Sandy Hill at the height of a tremendous war-production rush, Mr. Doane will step into responsible activities in charge of all inspection work on the four assembly lines which are turning out war products. He will have charge of the inspection of equipment produced by sub-contractors for Sandy Hill, and will also supervise the careful scrutiny and checking of completely assembled products as they leave the Sandy Hill assembly lines.

Fundamentally, Mr. Doane is an engineer, a graduate of Massachusetts Institute of Technology, class of 1920. Much of his life he has been using his technical background in confronting and solving paper mill problems.

While the national emergency and the need for speed in producing war material at present will constitute a man-size job for Doane, his basic training will eventually steer him into a spot where his talents can be used to advantage in the interests of buyers of paper and pulp mill machinery as built by Sandy Hill for many years.

Mr. Doane is secretary and treasurer of the New York-Canadian Association, and is a member of the executive council of the Empire State Section of TAPPI.

From 1920 to 1930 he was engaged in business with his father, Foster P. Doane, Sr., in sales and

Foster P. Doane, Jr.

mechanical development work for the textile industry.

From 1930 to 1935 he was research engineer in the research division of International Paper Company, working on production problems in the company's mills in the eastern United States and Canada. He was assigned to the Fort Edward mill in 1935, first as technical superintendent. Two years ago he became general superintendent. In the course of his experience with International, he became well informed on all angles of the production of book, bond, mimeo, litho, M.G. and other papers.

Mr. Doane married Miss Gladys Stewart in 1926 and is the father of two sons, Foster 3rd, aged 15, and William S. Doane, seven.

Urged To Eliminate Stitching Wire

[FROM OUR REGULAR CORRESPONDENT]

Washington, D. C., September 23, 1942—Manufacturers of folding and set-up boxes have been warned by the Containers Branch of WPB that preference ratings for steel stitching wire in packages will not be granted except for the most essential uses.

Franklin R. Kelly, acting chief of the Folding and Set-Up Box Section, urged manufacturers to eliminate metal stitching wire wherever possible. He pointed out that glues and paper corner-locks in many cases can be effectively substituted for the metal stitching wire.

The wire normally is used as a heavy metal staple in light weight paperboard boxes.

Sampling and Preparing Wood for Analysis

TAPPI Tentative Standard T 11 m-42

Scope

The following procedures are applicable to the preparation of wood samples for all chemical tests except the determination of cellulose. (*See* Additional Information.)

Sampling

The sample selected for chemical analysis shall be representative of the entire lot of material for which the analysis is intended to be significant.

(a) Logs

In taking a bulk sample from logs, select one typical log from each of not less than 5% of the total number of units to be represented — i.e., carloads, truckloads, cords, etc. — making up the aggregate for which the sample is to be representative. In no case shall the sample consist of less than ten logs, unless the aggregate consists of 200 logs or fewer, in which case not less than 5% of the logs nor less than five logs shall be selected. This number may be further restricted, however, if the total number of logs to be sampled is less than five.

A composite sample of the selected logs shall be obtained by either of the following procedures:

1. Use a power-driven saw arranged with a guide to permit cuts being made across the end of each log just the width of the saw teeth, the saw being fitted with a clean box or other device for collecting all the sawdust without contaminating the sample. With the guide removed from the saw, cut about one-third of the length off one or both ends of each sample log across a portion free from knots or decayed wood. Remove any bark from the sawed ends of the logs. Replace the guide, completely clean the box or collecting device, then take one or more cuts across each of the sawed ends of all the logs, and collect all the sawdust.

2. Saw a sample disk ¼ to 1 inch thick from each log, the disk being taken from a point not nearer the end than one-third the total length of the log. If only a single log is provided for analysis, saw three such disks from it, one from approximately the center of the log, and the other two about 6 inches from the ends. Cut all the disks into two semicircles or into four sectors by two cuts at an angle, depending upon the amount of sample required. Include opposite equal sectors in the final sample. Separate and discard all bark and knots. Reduce equal sectors situated opposite in the log from each semicircle to sawdust by means of the specially equipped power-driven saw described above, using the portion to be discarded for feeding the selected sector to the saw. Alternatively a hand rasp may be used to produce a satisfactorily divided sample from the sectors, but care should be taken to keep the teeth of the rasp clear and not to heat the wood unduly by vigorous rasping. In each case reduce a complete sector to sawdust or raspings so as to insure the correct proportion of sapwood and heartwood.

(b) Chips or Sawdust

If the sample is in the form of chips, sawdust, or otherwise subdivided wood, secure a number of representative portions to insure a fair analysis of the lot. If necessary, reduce the amount of material for analysis by quartering in the manner prescribed for coal. (*See* TAPPI Standard T 605 m.)

Grinding and Screening

If moist, let the composite sample air-dry thoroughly. Separate the finer material by sifting on a 40-mesh screen and grind the coarser material in a mill of the Bauer or Wiley type. A hand-driven grinding mill may also be found suitable. In no case, however, should a mill be used which heats the material appreciably during grinding or which produces an undue proportion of fines. It is preferable to use a power-driven screen because then the fine material may be more effectively separated. Again separate the finer material by sifting, regrinding any which is retained on the 40-mesh screen; and continue this procedure until all the sample passes through the screen. Sift the material after each passage through the grinding mill before regrinding so as to minimize the amount of fines produced.

Place the entire sample so prepared in an airtight container from which portions may be withdrawn for analysis as desired. It is well to expose the prepared sample to average atmospheric conditions for a period before closure to minimize changes in the moisture content of the material during subsequent handling and weighing operations.

Additional Information

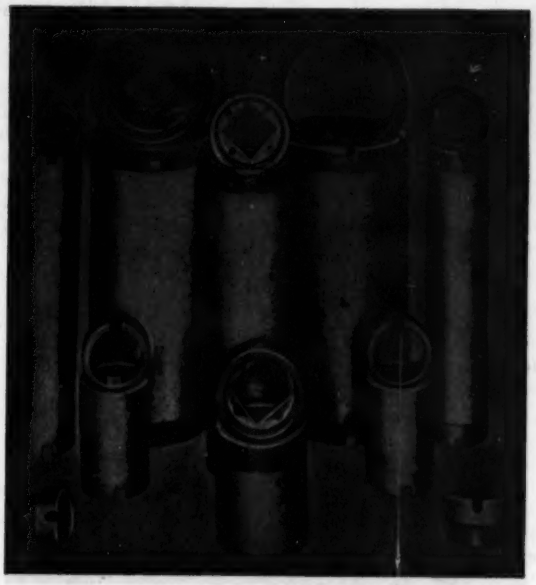
The particle size to which wood should be reduced for the purpose of certain analyses has been the subject of differences of opinion and no common agreement concerning the most suitable size has yet been reached. Two chief viewpoints have been presented:

(a) All the wood sample should be ground to pass a 40-mesh screen, and no further fractionation of the fine material should be permitted. Particles of 40-mesh and smaller are readily attacked by the reagents used in present analytical methods (except the cellulose method), and finer grinding may degrade the wood. Furthermore, the fine material should not be discarded, because fractionation of the wood meal may alter the proportion of certain constituents and might lead to erroneous analytical results.

(b) Wood samples should be of fairly uniform particle size. Especially in the determination of the cellulose content, this is desirable to avoid overtreatment of the smaller particles before the larger are completely delignified. Various ranges of particle size have been chosen for the sample for this determination, the ones now most favored being 40-60 and 60-80 mesh.

Until agreement is reached, it is recommended that the particle size employed for the determination of *cellulose* be stated as a part of the report.

Reprint Note: Reprints of TAPPI Tentative Standard T 11 m-42 may be obtained from the Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York, N. Y., at 25 cents each.



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IMPORTS OF PAPER

NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 19, 1942

SUMMARY

Newsprint .....437 rolls

NEWSPRINT

——, ——, ——, 437 rolls.

PAPERSTOCK

E. J. Keller Co., Inc., ——, ——, 37 bls. old canvas.

GLUE STOCK

——, ——, ——, ——, 713 bls.

BONES

——, ——, ——, 2392 bags.
——, ——, ——, 3552 bags.

Charge for Sanitary Napkins

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 16, 1942—Manufacturers, distributors and retailers of sanitary napkins are permitted to continue to add certain transportation charges to their maximum prices as the result of Amendment No. 2 to Maximum Price Regulation No. 140 issued by the OPA.

The amendment, effective September 16, adds a definition of the term "delivered" to the regulation and spells out the types of transportation charges which are now allowed.

The action recognizes that sales under certain conditions involved additional costs in the past and merely permits these costs, if still incurred, to be added to maximum prices fixed by the regulation.

As a result, manufacturers are now relieved of paying cartage charges, which they did not pay previously, when delivery from the terminal to the premises of the purchaser was not performed by the carrier. In such cases a manufacturer's delivered price is his price to the city of destination. Manufacturers, however, must continue to make delivery to the purchaser if the carrier performed storedoor delivery.

Wholesalers, under the provisions of the amendment, must continue to make free deliveries to their purchasers in free delivery zones recognized by the wholesalers during March. However, freight charges may be added to the price of shipments made by a wholesaler to customer outside his March free delivery zone.

Mail order houses are the only retailers affected by today's action. Postage costs were usually added to the price in sales made by this type of retailer and the amendment now permits them to add the amount of postage to their maximum prices. Consumers' prices remain unchanged except for the sales made through this channel.

H. T. Newell Jr. Gets Leave of Absence

H. T. Newell, Jr., secretary-treasurer of Jackson Paper Company, Jackson, Miss., has been given a leave of absence for the duration in order that he might accept an administrative position in the Price Division of the Office of Price Administration. He will be located in the Mississippi office of OPA. Mr. Newell has been associated with Jackson Paper Company for many years and will resume his duties with that organization at the conclusion of the war.

T. A. McDonald Dead

T. A. McDonald, well-known industrial labor consultant, died suddenly on September 17 while on a business trip to Thorold, Ont.

Mr. McDonald was 57 years old. He was born in New York City and attended Cornell University. After various types of work, he became interested in industrial labor problems, and in 1916 was associated with Dr. K. M. H. Blackford, author and industrial labor consultant at that time. In 1917 he went to Iroquois Falls, Ont., as employment supervisor for the Abitibi Power and Paper Company. During 1918 and 1919 he served as personnel consultant in the Emergency Shipbuilding Corporation at the Hogg Island Yards and elsewhere. In 1919 he returned again to the Abitibi Power and Paper Company as personnel supervisor and townsite manager where he remained until 1927, when he moved to New York City to take over the labor consulting work previously conducted by Dr. Blackford.

Mr. McDonald carried on consulting work for many of the large paper companies in Canada and in the United States. They included the Abitibi Power and Paper Company, Anglo Canadian Paper Company, Anglo Newfoundland Company, Ontario Paper Company, Quebec North Shore Paper Company, all in Canada, and the Oxford Paper Company, Brown Paper Company, the Riegel Paper Company, and the New York and Pennsylvania Paper Company, in the United States.

Mr. McDonald was a bachelor. He naturally had a wide acquaintance and a large number of friends among the workers and leaders of industry. He was a broad-minded, conservative man of high ideals, with a keen understanding of the many problems arising in labor relations and personnel work. His counsel was sought by both worker and management, and his fairness and sympathetic interest developed the confidence of all with whom he came in contact.

Mr. McDonald's death came as a great shock to all his friends. His kind and friendly influences will always remain cherished memories for he was a man who did nothing but good in the world.

Pulpwood Market Unsettled

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., September 21, 1942—The pulp and paper industry of this section is moving along under curtailed operations because of slack market conditions, according to some manufacturers. Prospects of a ceiling on pulpwood, which may be placed in November, forecast something in the way of a stabilization of production costs and is expected to have a salutary effect upon the paper industry. At the present time pulpwood prices remain at about the same level as for the past several weeks, $19 to $20 a cord for a good quality of four-foot peeled spruce. The bulk of the product used in this section comes from Canada and although boats are scarce it is coming in by water. A little of the product, however, is being moved by rail. According to report, not much peeled wood was made last spring due to labor scarcity and the pulpwood market is now in a more or less unsettled condition due to the prospect of a price ceiling later in the fall.

TIMBER
In The War Effort

TIMBER is one of the vitally important raw materials necessary in the conduct of war.

THROUGH its forestry program the Seaboard Air Line Railway is promoting timber growing in the South in accordance with the concepts of sound forestry practices.

THIS HELPS not only to insure an adequate supply for our war needs but also to build up our forests for the future benefit of our wood-using industries.

INDUSTRIAL DEPARTMENT
SEABOARD
AIR LINE RAILWAY

Warren T. White
General Industrial Agent
Norfolk, Va.

12 WAYS TO ADD LIFE TO YOUR FELTS

To help you get more wear from your felts and thereby save wool, Orr presents this check list for your help and information.

1) Do you check suction box covers for splinters and abrasives and dress them frequently?
2) Do you examine rolls, boxes, and journals for surface grease and remove at once if found, before attempting to place felt on machine?
3) Have you recently checked felt rolls for balance? For free turning?
4) Is your felt cleaner, particularly those parts touching the felt, in excellent condition?
5) Are you sure that your felt stretchers are operating freely?
6) Do you know if the crowning of your press rolls is correct? Are these rolls in alignment?
7) Are you sure your whipper arms are operating evenly and with correct amount of whip?
8) Are holes in shower pipes open and applying correct spray?
9) Do you check water temperature and insist that correct temperatures be maintained?
10) Have you checked for presence of iron hydroxide in the water, the chemical that makes felts stiff and boardy?
11) Are deckles on board machines smooth and free from rough edges?
12) Have Orr Sales Engineers told you the latest method of cleaning, drying, and storing felts?

Orr Felt representatives are eager to help you. Call for them when reordering felts or when needing assistance.

ORR FELTS THE ORR FELT AND BLANKET CO., PIQUA, OHIO

New York Paper and Pulp Market Review

Demand For Many Grades of Paper Is Reported Moderate This Week and Under Expectations—Pulp Market Fairly Active With Bleached Grades Scarce—Waste Paper Market Is Little Changed.

Office of the PAPER TRADE JOURNAL.
Wednesday, September 23, 1942.

Buying of paper in the wholesale market is moderately good but somewhat under expectations at this date. Reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week reflect the general uncertainty prevailing over impending high taxes and the apparent inability to enact an adequate tax bill. Concern is also expressed regarding the very serious implications in the expected adoption of a concentration of industry to increase the all-out war effort.

The index of general business activity for the week ended September 12, rose to 131.9%, from 130.8% for the preceding week, compared with 129.2% for the corresponding week last year. Paper board production was fractionally lower.

Paper production for the week ended September 12, a holiday period, was estimated at 71.2%, compared with 104.2% for 1941, with 84.0% for 1940, with 92.2% for 1939, and with 79.6% for the corresponding week for 1938.

Paper board production for the week ended September 12 was 65.0%, compared with 98.0% for 1941, with 76.0% for 1940, with 79.0% for 1939, and with 71.0% for the corresponding week for 1938.

Another rather impressive example of the volume of paper consumed by the government is the announcement by the Office of Price Information, that 150,000,000 new ration books will be printed to insure adequate supplies at all distribution points for 132,000,000 persons.

Many reports this week indicate that demand for some major grades of paper is moderately good. Prices are quite well maintained and no important change has been reported at this date.

Wood Pulp

The chemical wood pulp market reports an easy supply situation in unbleached sulphate, and in the lower grades of unbleached sulphite pulp. Prime grades of bleached sulphite are scarce. Good grades of unbleached sulphite are reported more active. Prices are unchanged.

Rags

Mill buying of new cotton cuttings is reported fair this week. Reports still continue to reflect less than seasonal supplies are available this year. No important price changes have been reported. The OPA has issued Amendment No. 3 to Price Schedule No. 47, Old Rags. Monthly reports from suppliers on lots of ten tons or more in any one month, are no longer required.

Demand continues good for roofing rags as felt mills are operating at a relatively high level. Prices are well maintained at maximum prices.

Old Rope and Bagging

Trading in old rope is fair at this date, with reports indicating the expectation of better demand. The Ceiling price on old No. 1 Manila rope is well maintained. Strings and threads are in moderately good demand. Prices are unchanged.

No important change has been reported in scrap bagging at this date. Mill buying is only fair and under the influence of limited jute supplies, prices are firm.

The WPB announces that jute, no longer available from India, is being replaced by osnaburg cloth, fabricated from cotton grown on prison farms in the South. This cloth will be used extensively for camouflage purposes, and in the manufacture of utility bags for sand.

Old Waste Paper

Demand for the lower grades of paper stock is steady at this date. Mill buying of the high grades is fair. Prices are unchanged.

Twine

No important change has been reported in the twine market at this date. Government demand for cordage and twine continues high. Normal trade is rather quiet. Prices are unchanged.

Hurlbut Paper Co. Wins Flag

LEE, Mass., September 21, 1942—Edward M. Powell, deputy administrator of the War Savings Staff of the United States Treasury Department, presented the Hurlbut Paper Company in South Lee with a certificate and Minute Man flag bearing the Treasury "T" at impressive ceremonies at noon on Wednesday of last week.

The program, attended by a large group of the employees, and guests representing the other industries and banks of the community, opened with the singing of "America." Edward A. Sitzer, president, spoke a few words, explaining the significance of the award.

Mr. Powell then presented the certificate and the flag to Harry A. Bourn. He congratulated the employees for their enthusiastic and significant response to the war savings program. He spoke briefly of the present war conditions, stressing the need for such cooperation as had been shown by the people of the Hurlbut Company. He also congratulated Mr. Bourn, who has a son serving in the Navy, a daughter, a first lieutenant serving with the Army nurses. Another son is soon to enter the service.

Pioneer Paper Stock Leases Building

PHILADELPHIA, Pa., September 21, 1942 — The three one, two and three-story buildings at the northwest corner of 22d and Westmoreland streets, containing a total floor area of 47,000 square feet, have been leased by Frank G. Binswanger, representing the Vermont Marble Company, to the Pioneer Paper Stock Company, which formerly occupied the property at 5th and Bristol streets, taken over recently by the Government.

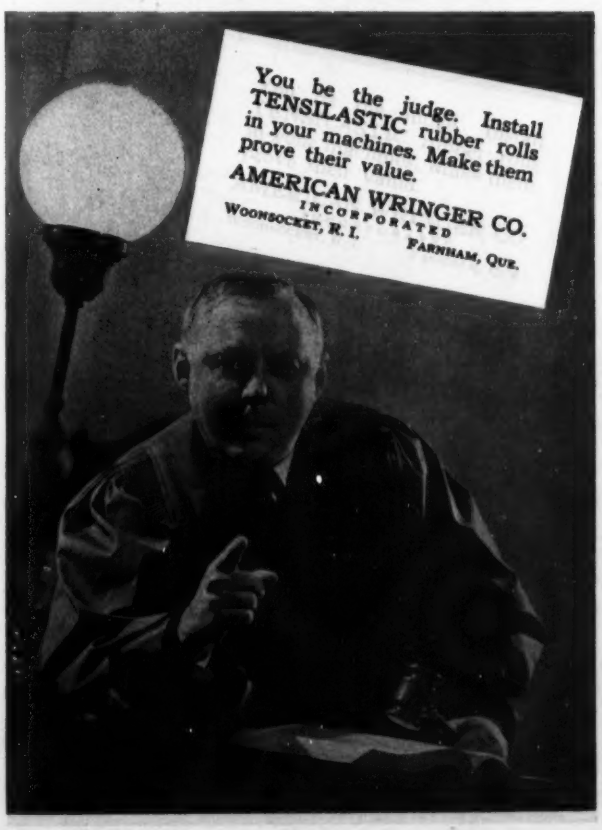
Keep Your Present SCREEN PLATES on the Job

★

We can reclose and recut plates satisfactorily that you normally would discard.

New plates available on War priorities, and on A-10 for emergency repair and maintenance.

Union Screen Plate Company
FITCHBURG, MASSACHUSETTS
(Associated with Union Machine Co.)


You be the judge. Install TENSILASTIC rubber rolls in your machines. Make them prove their value.
AMERICAN WRINGER CO.
INCORPORATED
WOONSOCKET, R. I.
FARNHAM, QUE.

...and the DESIGN of APPLETON FELTS has kept pace with the PROGRESS in PAPERMAKING

Technical foresight in the design of Appleton Felts as the first step in their manufacture has kept Appleton Felts in step with the progress in the paper industry. In 1890, when Appleton Felts were first designed and made, the requirements in felts were few. Today high speed production exacts everything plus, and to be preferred by mills, felts must fully come up to these exactions. Since 1890 Appleton Felts have met all requirements of paper mills—today the standard for those characteristics mills prefer in felts.

make APPLETON FELTS good paper

APPLETON WOOLEN MILLS, APPLETON, WIS

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, September 23, 1942.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Supply under allocation control. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN — Quotations on casein are higher for the week. Standard domestic casein, 20-30 mesh, is quoted at 19 cents per pound; 80-100 mesh at 19½ cents per pound; all prices in bags, car lots. Argentine casein, 20-30 mesh, at 7½ cents per pound, c.i.f., is reported nominal. No quotations on French casein.

CAUSTIC SODA—Prices of caustic soda are reported unchanged. Supplies ample. Demand moderate for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher for the current week. "G" gum rosin is currently quoted at $3.41 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.41 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is quoted at $3.63 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported fair for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported fair. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels Per Case			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.50		5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

*OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices

Rag Content Bonds and Ledgers White, Assorted Items. Delivered in Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	$40.25@$47.25	$41.40@$48.50
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	" "	32.20 " 37.75
75% Rag	24.75 " 29.00	25.90 " 30.50
65% Rag	" "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra

Sulphite Bonds and Ledgers — White Assorted Items Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers White Coated Paper

Delivered in Zone 1

No. 1 Glossy Coated	$13.65	@$15.50
No. 2 Glossy Coated	12.40	" 14.00
No. 3 Glossy Coated	11.60	" 13.25
No. 4 Glossy Coated	11.15	" 12.75
No. 1 Antique (water marked)	10.25	" 11.75
No. 2 Offset	9.60	" 11.00
A Grade E. F.	9.35	" 10.75
A Grade S. & S. C.	9.60	" 11.00
B Grade E. F.	8.85	" 10.25
B Grade S. & S. C.	9.10	" 10.50
C Grade E. F.	8.55	" 9.75
C Grade S. & S. C.	8.80	" 10.00
D Grade E. F.	8.25	" 9.50
D Grade S. & S. C.	8.50	" 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	64.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50
	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	8.00	@ 8.25
Silesias No. 1	4.50	" 4.75
New Unbleached	8.00	" 8.25
Blue Overall	5.75	" 6.00
Fancy	3.00	" 3.25
Washables	2.50	" 2.75
Mixed Khaki Cuttings	2.50	" 2.75
O. D. Khaki Cuttings	3.00	" 3.15

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
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Manufacturers of

ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

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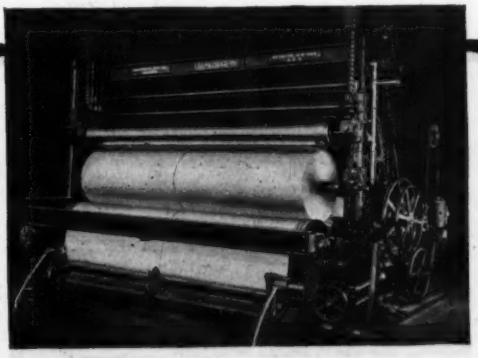
KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina



CONTROLLED Paper Roll Density

CAMACHINE 15, a new development, gives you precisely the paper roll density needed for good shipping and good control of the web in unwinding. Proof of this is readily found in the service records of this machine; for example, one mill's first installation has resulted in four re-orders. In addition to careful counterweighting, Camachine 15 has large diameter rewind drums and riding roller, of a type heretofore available only on much heavier equipment. Write for details.

CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, N. Y. Midwest Office, Harris Trust Bldg., 111 W. Monroe St., Chicago.

CAMACHINE

These are two of our high production machines—of a varied line—now available only if you need them to help win the war.

Our plant facilities are completely engaged in getting equipment ready for our fighting forces. Until all-out efforts triumph other things must wait—paper converting machinery included.

PAPER CONVERTING MACHINE CO.
GREEN BAY, WISCONSIN
Manufacturers of paper converting machinery for all purposes

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE

Old Rags

White, No. 1—			
Repacked	*1.80	"	—
Miscellaneous	*1.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All prices nominal

New Rags			
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25
Old Rags			
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	*4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Mixed Books	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	1.75	"	—
Old Corrugated Containers	1.00	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¾
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02½	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings— (Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.00	@	4.25
Sisal Rope	4.50	"	4.75
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	4.50	"	—
Scrap Sisal	4.50	"	4.75
Scrap Sisal for Shredding	4.75	"	5.25
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.75
Aust. Wool Pouches	3.85	"	5.10
New Burlap Cuttings	5.25	"	5.50
Heavy Baling Bagging	4.25	"	5.75
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04¼	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06½	"	.07
New Light Flannelettes	.06	"	.06¼
Canton Flannel, Bleached	.06¾	"	.07
Underwear Cutters, Bleached	.06½	"	.06¾
Underwear Cutters, Unbleached	6.50	"	6.75
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03¾	"	.04
Red Cotton Cuttings	.03¾	"	.04
Soft Unbleached	.07	"	.07¼
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.03½	"	.03¾
O. D. Khaki	.04	"	.04¼
Corduroy	.03½	"	.03¾
New Canvas	.07	"	.07½
B. V. D. Cuttings	.07¼	"	.08

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 2 Roofing Rags	1.45	"	—